The cost of cancer

Henry Featherstone & Lilly Whitham

Executive Summary

One in three people will develop cancer during their lives, with over one in four people in the UK eventually dying from the disease. It is the second largest cause of death behind cardiovascular disease, with lung cancer continuing to be the single biggest cancer killer. It is little surprise, therefore, to learn that cancer is considered a top priority for the NHS by the general public, more so than Alzheimer's disease, HIV/AIDS and obesity.

The last decade has seen improvements in cancer care in the UK and as a result there have been significant reductions in mortality rates: almost a 20% reduction since 1995. However, for all these achievements the UK continues to have mortality rates above the European average and, crucially, we have not made progress in closing the gap in performance with other countries. There are many reasons why we are lagging behind our European neighbours: late diagnosis, poor outcomes for older people, the perennial issue of poor survival in deprived communities, and the UK's relatively poor uptake of new treatments and technologies.

As the UK population ages, treating and caring for patients with cancer will account for an ever increasing proportion of spending on healthcare. However, the economics of cancer care have received relatively little attention in the UK. In this paper we use the human capital approach to calculate the total costs to society of cancer in 2008. We use data from the Office for National Statistics (ONS) and peer-reviewed published sources. We find that in 2008 the cost of cancer was £18.33 billion, and that these costs will increase to £24.72 billion by 2020.

The cost of cancer in 2008

Cost component	£ (billion)
Healthcare costs	
NHS costs	5.13
Hospice costs	0.36
Costs to family and patient	0.08
Losses in productivity	
Cancer survivors (paid & unpaid work)	5.49
Cancer deaths (paid & unpaid work)	7.27
Total cost of cancer	**18.33**

Our analysis also considers the potential savings - in terms of lives and costs to society - if survival rates in England were among the best in Europe by 2020. We estimate that, on a cumulative basis by 2020, total costs could be reduced by £10 billion and a staggering 71,500 lives could be saved if cancer services in England were improved to be among the best in Europe.

Projected societal cost of cancer at current and European best survival rates
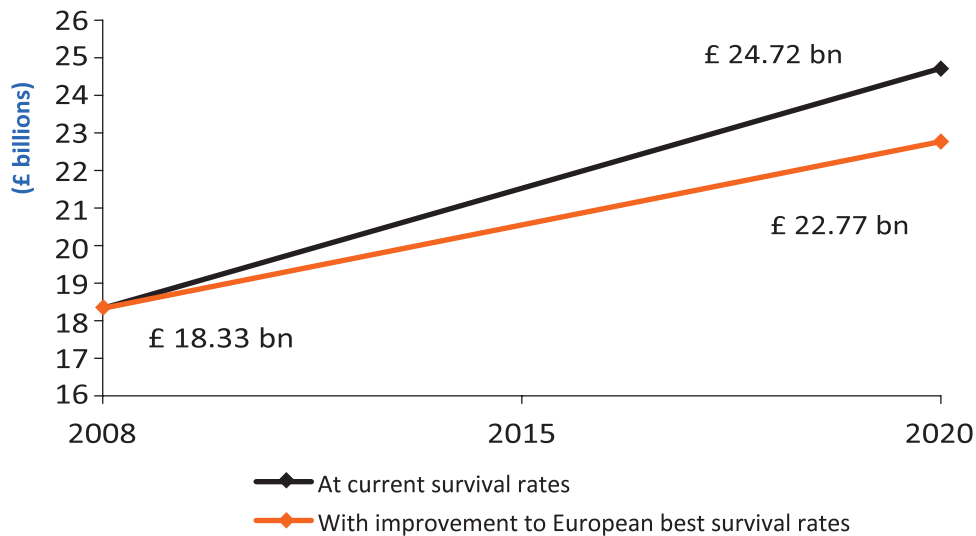
In order to help improve cancer services in England we recommend:

- The Department of Health should begin a process of benchmarking elements of best practice in cancer services from among our European neighbours. This assessment should include patient awareness, early diagnosis, access to new cancer treatments and technology and service configuration.

- When planning future NHS expenditure on different disease areas the Department of Health should consider public priorities and take account of the economic impact of diseases such as cancer. We recommend regular national surveys, as well as further and repeated analysis of the societal cost of cancer.

- The Department of Health should focus NHS attention on improving those areas of cancer services where the largest reductions in mortality can be achieved. These include earlier diagnosis, improving the treatment received by older people, targeting deprived communities, and ensuring the spread of approved treatments and technologies.

- Notwithstanding the importance of early diagnosis and improved access to new treatments and technologies to improve cancer survival rates, we should be clear that prevention, as ever, is better than cure. The most efficacious and cost-effective method for reducing cancer mortality and the resulting societal cost is to continue to focus resources and efforts on reducing smoking prevalence.

- Given the importance of early diagnosis to cancer outcomes, we believe the stage of diagnosis should be included in the Quality and Outcomes Framework of the GP contract. 1-year survival rates are an effective proxy measure, until accurate staging data becomes available.

Introduction

Cancer is a group of diseases characterised by uncontrolled growth and spread of abnormal cells, which can result in death. It is caused by both external factors (eg toxic chemicals in tobacco smoke, radiation, or viruses for cervical cancer) and internal factors (eg hormones, immune conditions or inherited genetic conditions). Today, cancer is treated with surgery, radiotherapy, chemotherapy and newer treatments like immunotherapy.

One in three people will develop cancer during their lives, with over one in four people eventually dying from the disease: in England, cancer accounts for 30% of male deaths and 25% of female deaths.[1] It is the second largest cause of death behind cardiovascular disease, with lung cancer continuing to be the single biggest cancer killer. Among the general public cancer is seen as the top disease priority for the NHS.[2,3] In 2006, a national survey found that cancer is a key public priority, both in absolute terms and compared with other illnesses and disease, as seen in the table below. Other surveys have shown that cancer is one of the public's greatest fears, more so than murder, terrorism or any other health threat.[4] Americans also perceive cancer to be a top public priority, with 48% of them fearing it more than any other illness.[5]

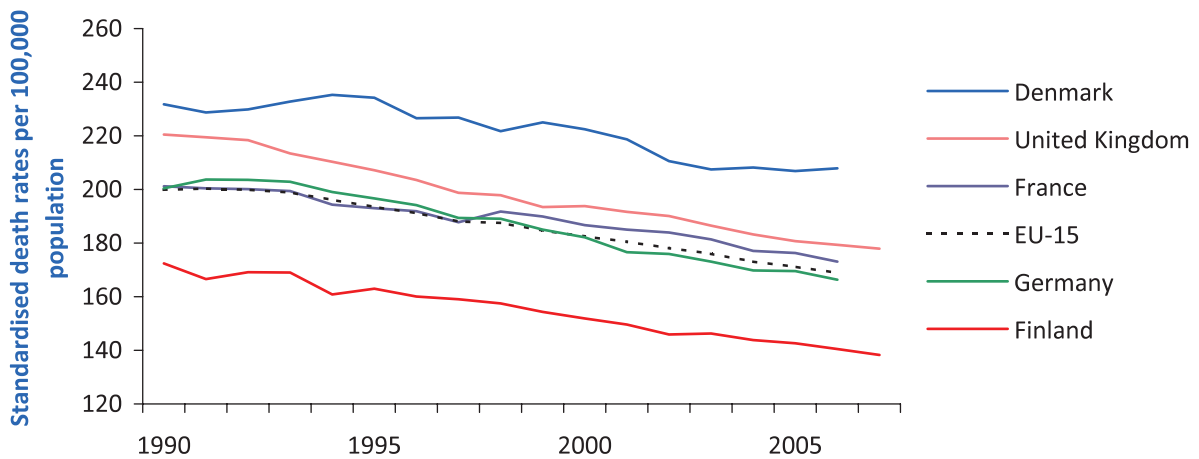## Britain's Attitudes Towards Cancer

Which illness or disease do you think should be a national health priority?	% of respondents
Cancer	76
Heart disease	41
HIV/AIDS	20
Diabetes	19
Alzheimer's disease	16
Mental Illness	16
Obesity	9

Source: Ipsos MORI, Cancer – A Public Priority? Attitudes Towards Cancer Treatment in Britain, Cancerbackup, 2006.

In the last 20 years, the UK has seen a substantial decline in cancer mortality, which is consistent with the general European trend. The fall in mortality rates in England is on course to meet the Government's target of a 20% reduction from 1995 to 2010. By 2008, the reduction was 19.3%.[6] However, the constant charge against UK cancer policy is that we have not made significant progress in closing the gap with our European neighbours. In 2005, UK mortality rates – as a general measure of cancer treatment - were still higher than many other European countries, and still significantly above the European average, as seen in the graph below.

These improvements in survival have been matched with increases in resources. Since the implementation of the Cancer Plan in 2000 the NHS has received substantial increases in funding for cancer services. In 2002-2003 the NHS spent £3.28 billion on cancer treatment (£3.83 billion at 2008 prices), which has increased to £5.13 billion in 2008-2009.[7,8] Interestingly though, the Government's Cancer Reform Strategy states that England spends 5.6% of its public healthcare budget on cancer, compared to 7.7% in France, 9.2% in the United States and 9.6% in Germany.[9]

Death rates from cancer in selected European countries

Standardised death rates per 100,000 population

Legend:
- Denmark
- United Kingdom
- France
- EU-15
- Germany
- Finland

Source: WHO Health for All Database, Accessed December 2009.

In general, when talking about cancer survival rates, 5-year relative survival is most commonly used. This is because 1-year survival measures give only a very short term prognostic view whilst for 10-year survival the lag between diagnosis and review is considered to be too long. High 1-year survival rates are generally accepted as a good proxy measure for early diagnosis. However, survival rates do not represent 'cure' rates; rather, they are the percentage of patients that are alive five years after their cancer is diagnosed. The most widely known comparative study looking at cancer survival rates in Europe is the EUROCARE-4 study published in 2007. Because of the time lag between diagnosis and measuring 5-year survival rates, the EUROCARE-4 dataset compares cancers diagnosed in 1995, which is before the Cancer Plan in 2000 and the significant increases in funding for cancer services.

Five-year survival rates from all cancers between 1995-1999

Five-year relative survival rates (%)

England, European Average, Germany, France, Finland
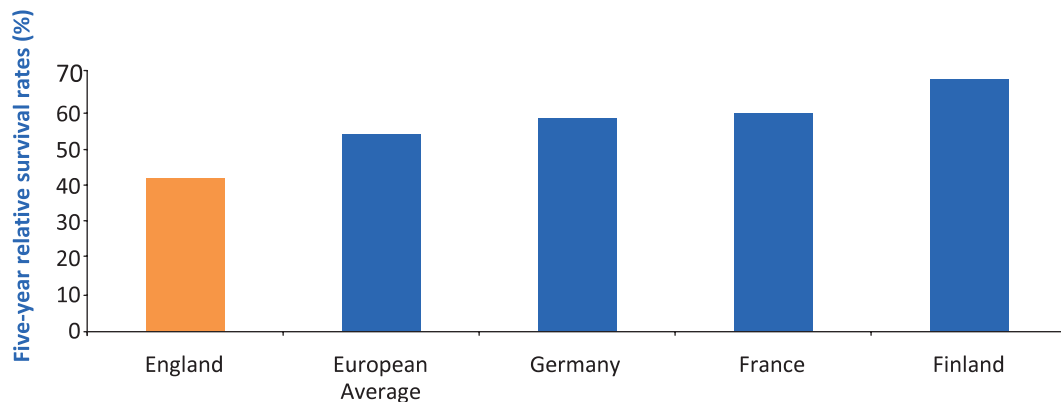
SOURCE: Berrino et al. "Survival for eight major cancers and all cancers combined for European adults diagnosed in 1995-1999: results of the EUROCARE-4 study", Lancet Oncology, vol. 8, no. 9, pp 773-783, 2007

There have, however, been questions about the validity of the EUROCARE-4 data which, it is suggested, paint the NHS in a poorer light than is in fact the reality.[10] The concern is that not all countries have cancer registries comparable to the UK, which covers 100% of the population.[11] For example, Germany only has 1% coverage and France is only 17%. Indeed, UK cases make up 40% of the EUROCARE-4 dataset.[12] Nevertheless, when comparing the UK to countries such as Canada, Sweden and Norway, which have full national cancer registration data, our relative performance still has some way to go. An example of this can be seen in the graph below, which shows 5-year survival rates for breast cancer – the most common cancer in women.[13]

Five-year survival rates from breast cancer
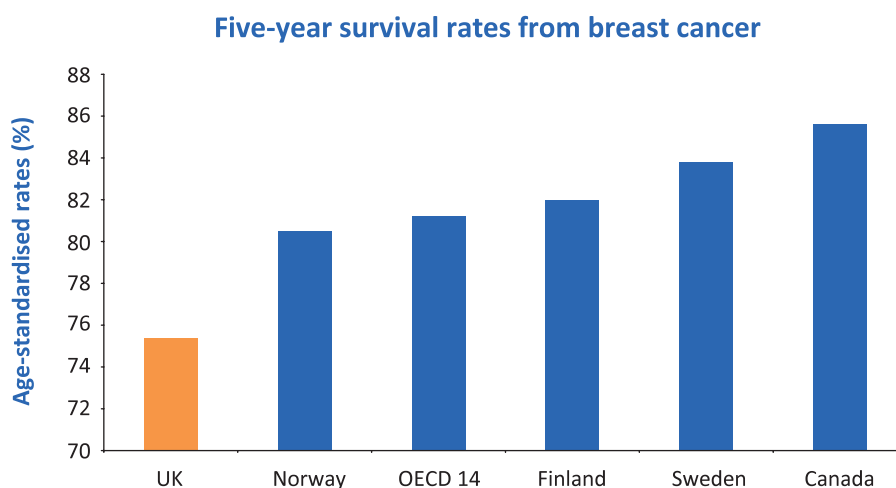
SOURCE: Organisation for Economic Co-operation and Development, Health at a Glance 2009, 2009.

There is no simple answer to why our cancer survival rates are poor when compared to other countries. It is beyond the scope of this paper to consider possible causes in any depth, which are multi-factorial with a complex interplay between different causes which is not yet fully understood. We do, however, highlight in broad terms the reasons most commonly cited behind England's poor outcomes. One of the likely causes is delays in diagnosis. According to the National Cancer Director, Professor Sir Mike Richards, "Raising awareness and promoting early diagnosis are essential if we are to bring cancer survival rates up to the level of the best in Europe."[14]

Other explanations for England's poor cancer outcomes include the lack of progress in reducing cancer death rates in people aged 75 and over[15] and historically poor cancer survival rates in deprived areas of the country.[16] Patients in deprived areas are covered by the Spearhead Primary Care Trusts, where people with cancer are more likely to be admitted as emergency cases and are less likely to receive preferred treatments for their disease.[17] Another possible explanation behind our poor survival rates is the relatively slow adoption of new treatments and technologies compared to our European neighbours. Cancer patients in the UK have reduced access to treatments such as radiotherapy, which contributes to 40% of cases where a cancer is cured,[18] while UK spending on cancer medicines is only about 60% of that recorded in other advanced European countries.[19] This is in contrast to studies which find that the UK has the highest spending on oncology research in Europe.[20] This broader principle of slow and poor uptake of new treatments and technologies in the NHS was considered extensively in our earlier report, *All change please*.

Estimating the cost of cancer

Treating and caring for patients with cancer will account for an ever increasing proportion of spending on healthcare: population ageing, improved treatments and advances in care have all made cancer a chronic controllable illness.[21] Therefore, estimates of the economic burden of different diseases will be important as the NHS sets its priorities for the next decade. However, the economics of cancer care have received little attention in the UK.

Studies in the USA have calculated both the cost of cancer treatment and the wider costs to society. The National Cancer Institute reports that, in 2004, $72.1 billion was spent on cancer treatment, which is just under 5% of US spending for all medical treatment. The Institute also estimated that the total economic burden of cancer - including losses in time and economic productivity - was $190 billion in 2004.[22] Other US based estimates have projected the value of lost productivity to be $147.6 billion for 2020.[23]

Multiple methods exist for conducting economic evaluations of healthcare and each have their merits depending on the goal of the evaluation. In this report we adopt a societal point of view because it takes the broadest outlook and is, from an economic perspective, always considered relevant.[24] Standard societal cost evaluations in health economics should include three categories of cost: 1) health care costs, 2) costs to the patient and their family, and 3) productivity losses.[25] We should also make clear that, given the devolution of NHS planning to Wales and Scotland, this study only looks at the cost of cancer in England based on incidence.

1.   Health care costs

NHS costs

These are the costs involved in organising and delivering cancer treatment programmes which include the costs for diagnosis, treatment, continuing care, rehabilitation and terminal care costs from the disease.[26] In the UK these costs are given in the NHS programme budget data and are calculated using accounts from the Department of Health, its arms-length bodies, Primary Care Trusts and Strategic Health Authorities.

Estimated NHS spending on elements of cancer care

Elements of NHS spending on cancer care	% of total NHS cost*	Estimated cost in 2008-09 (£ million)**
Inpatient costs	27	1,386
Surgery	22	1,129
Drugs	18	924
Outpatients	8	410
Screening	5	256
Radiotherapy	5	256
Specialist Palliative Care	5	256
Other	10	513
Total		**5,134**

Source: * Cancer Reform Strategy 2007, Page 119. ** Author's calculations from NHS data. Estimated England level gross expenditure by Programme Budget, January 2010

The Department of Health gives the total cost of treating cancers and tumours as £5.13 billion, which accounts for 5.3% of total NHS spending in 2008-09.[27] In previous reports, we have noted the unnecessarily complex, impenetrable and unhelpful nature of NHS costs and accounts. We make this observation again and highlight

the fact that the breakdown figures in the table above are estimated costs that we have calculated from published NHS data, rather than official Department of Health figures.

The majority of the costs of running the hospice movement in the UK come from independent charitable sources and we assume that not all of these costs will be captured by the NHS programme budget data. The National Audit Office (NAO) found that the annual expenditure of all independent hospices in England in 2006/2007 was £500 million.[28] To avoid double counting in our calculation we have subtracted the 26% of hospice expenditure which is paid for by Primary Care Trusts (PCTs) and then applied an NHS spending annual inflation rate of 3.3% to bring the costs up to 2008 prices.[29] The resulting figure is applied to ONS data which indicates that 92% of all hospice deaths are due to cancer.[30]   We find that the total spending on cancer in independent hospices is £363 million.

2.   Costs to the patient and their family

These are the out-of-pocket expenses incurred by patients or family members when accessing or contributing to the patient's treatment. They include such things as the charges associated with travel to and from hospital for radiotherapy or chemotherapy sessions, and NHS hospital car parking charges.

A study conducted by MacMillan Cancer Support found that cancer patients spend, on average, £325 a year on travel and associated costs.[31] Patients and their families reported making an average of 53 trips to the hospital over the course of their treatment. Petrol and paying for parking at hospitals was said to be a large burden on patients. While financial assistance is available through the Hospital Travel Costs Scheme (HTCS), few patients said they were informed of the scheme and those that tried to use it encountered substantial bureaucratic barriers.

We estimate the travel costs of cancer patients and their families in 2008 to be £80 million.[32]

3.   Productivity losses

The most widely used methodology for calculating productivity losses in cost of illness studies is the human capital approach.[33] This approach has a long history in economic and health services research as a robust and reliable method to calculate the expected life time output that would have been realised had the disease or death been avoided. This methodology includes estimates for both work that is paid for through wages and activities that are not paid such as caring duties or housework.

It is sometimes suggested that the values used to estimate productivity in the human capital approach, such as gross earnings and the imputed value of unpaid work, can overestimate the true cost to society of a lost worker.[34] This is because lost productivity can easily be compensated for by a replacement worker and this argument becomes increasingly valid in times of high unemployment. Mindful of these concerns, we have adopted a conservative approach using age-specific, rather than average, wage rates to reflect productivity losses at the margins.

However, because it relies on earnings as the basis for its cost estimate, the human capital approach does tend to give greater weight towards working age men compared to women, the young, ethnic minorities and the elderly. Furthermore, we should be clear that the human capital approach does not attempt to measure the value of a life; rather, it is purely a means to capture the loss of economic output.

Cancer survivors unable to return to paid work

Most people survive cancer. Nevertheless, many that do are unable to return to full activities and that includes returning to work. To capture these costs to society we have calculated the number of cancer survivors based on the most recent incidence figures and applied the most recently available 5-year survival rate given for all cancers.[35] We make two observations here: first, that the most recent incidence figures relate to 2007 and later figures are, at the time of writing, unavailable from the ONS. Second, that the most recent 5-year survival statistics we use relate to cancers diagnosed from 1997-2001.[36] While we accept that these figures are necessarily out of date, we use 5-year rather than 1-year survival rates because we make projections well into the future and there is disparity between the figures which could produce an overestimation of the cost.

Published academic research has found that 74% of survivors under the age of 50 will return to work, while only 30% of survivors over 50 will do the same.[37] We then apply the ONS's employment rates by age group to give the number of cancer survivors in the labour market. [38,39] We apply these figures across the detailed breakdown of recorded cancer incidence which is given in 5-year age cohorts for both males and females. The result is a set of detailed calculations for the loss in productivity over the working life of each age cohort of cancer survivors. Productivity losses for a 5-year period were calculated by multiplying the number of cancer survivors in each age cohort by the average earnings for that age group as given by the ONS.[40]

We made a number of assumptions in our calculation. First, we assumed that those not currently in the labour market will enter at 16 years old. Second, we assumed that all those who survived cancer in 2008 and did not return to the labour market would have lived a full life to their retirement and that their productivity would not have been affected by any other health problems. Third, we did not automatically assume that all workers left the labour market at statutory retirement age, because increasing numbers of people are choosing to work beyond the pension age.[41] We assumed a level of economic activity up to the 70-74 age cohort as employment rates for this age range are produced by the ONS. We also based our calculation on the changes in retirement age brought in by the Pensions Act 2007, making the retirement age for individuals in younger cohorts different to those that died in older cohorts.[42]

To account for losses in future earnings we made calculations for each 5-year age cohort as they would have moved through their working life to give a value for life-time earnings. To estimate the future increase in wages, we apply the average rate of increase in real earnings calculated from ONS data. Since we make calculations of earnings for well into the future, it is necessary to apply a discount rate to these figures for life time earnings. Discount rates increase the value of money today above the value in the future to reflect people's preference for having benefits today rather than in the future.[43] We apply the HM Treasury real discount rates which are used by the Department of Health.[44,45] The value is 3.5% for earnings calculations 0-30 years into the future and 3.0% for periods covering 31-75 years.

We calculate the total loss in productivity of cancer survivors unable to return to paid work to be £5.30 billion.

Cancer survivors unable to continue unpaid work

The human capital approach suggests that the value of unpaid housework activities should also be included in the calculation of productivity losses.[46] A commonly used method to quantify the value of unpaid housework is the replacement approach, ie the value of the housework is equal to the cost of replacing it. Most replacement approaches divide the tasks involved in housework and family care giving, such as cooking and cleaning, and use the going wage rate for workers in these roles to estimate what it would cost to replace the person within the family that would normally do all these tasks.[47]

We have, therefore, used a replacement wage rate which accounts for half of the annual earnings of a domestic cleaner and half of the annual earnings of a care assistant or home caregiver to derive the replacement value of nonmarket home care activities.[48] We assume that the same percentage of unpaid workers unable to return to their normal activities is the same as for paid work. To account for future wage increases we applied the average rate of increase in real earnings calculated from ONS data. These real wage rates were applied to the number of cancer survivors that we calculated who would be economically inactive and doing family or home care activities.[49] HM Treasury discount rates were also applied because some of the age cohorts were looking 40 years into the future.

We calculate the total loss in productivity from cancer survivors unable to perform unpaid housework and caring duties to be £190 million. The table on page 14 provides a full illustration of the calculations used to estimate losses in productivity for cancer survivors.

Cancer deaths losses from paid work

During 2008, cancer claimed a total of 128,802 lives in England – this is 27% of all deaths.[50] Since recorded cancer deaths are also given in 5-year age cohorts for both males and females, we were again able to produce detailed calculations for the loss in productivity over the working life-time of each age cohort using a similar methodology as above. ONS employment rates by age group were then applied to estimate the number of people who died from cancer that would have been in employment.

For example, ONS data shows that 98 males aged 20-24 died from cancer in 2008.[51] Using the ONS employment rates for each age group we calculated that of those males aged 20-24 that died, 65 would have been employed.[52] Productivity losses for a 5-year period were calculated by multiplying the number of employed males aged 20-24 by the average earnings for that age group as given by the ONS.[53] Future losses in earnings were made for each wage bracket as the 5-year age cohort would have moved through their working life. Appropriate HM Treasury discount rates were applied. We calculate the loss in productivity of cancer deaths from paid work to be £7.06 billion.

Cancer deaths losses from unpaid work

Using the same methodology explained above for cancer survivors we calculated the costs of cancer deaths that would be borne by those economically inactive and doing family or home care activities.[54] We calculate the loss in productivity from unpaid housework and caring to be £213 million.

Losses from informal care

Informal care is the care and support that carers give to their spouses, friends or relatives suffering from cancer. Other studies have attempted to include these costs in their calculations, with one recent study finding that these costs were approximately 10% of total productivity losses. However we note that this recent study based its calculation on care given to breast cancer patients who, in relative terms, have high survival rates and therefore low care needs.[55] We conclude that there is insufficient data in the UK for us to be able to make a comparably robust calculation to include in this study. The caveat is that our total figure for the societal costs of cancer is likely to be an underestimate.

Using data from the Office for National Statistics and peer-reviewed published sources we find that in 2008 **the cost of cancer was £18.33 billion**.

The cost of cancer in 2008

Cost component	£ (billion)
Healthcare costs	
NHS costs	5.13
Hospice costs	0.36
Costs to family and patient	0.08
Losses in productivity	
Cancer survivors (paid & unpaid work)	5.49
Cancer deaths (paid & unpaid work)	7.27
Total cost of cancer	**18.33**

Projecting the cost of cancer in 2020

Many cost of disease studies in the academic literature include forward projections in order to help better inform strategic policy making. Of course, all projections that try to accurately predict the future are fraught with difficulties and inaccuracies, and we therefore limit our projection to 2020.

Healthcare costs

The Department of Health estimates that with the 1.5% annual increase in incidence in England, the baseline costs of treating cancer will increase by £70 million each year. This allows us to simply adjust the healthcare costs of treating cancer in 2008.[56] The estimated costs to the NHS in 2020 are £5.98 billion.

The costs of independent hospice care were also up-rated to account for the increase in incidence. These costs in 2020 are estimated to be £424 million.

Costs to the patient and their family

To project the future costs to patients and their families, we use the original value of £325 in out-of-pocket expenses. While there is discussion of eliminating parking costs for some hospitals or patients, we assume that the costs included in this value remain the same. We apply the breakeven inflation rate of 3.05% and a 1.5% annual increase in incidence to calculate the total travel costs to patient and family in 2020 as £144 million.[57]

Productivity losses

As noted above, the Department of Health estimates that cancer incidence is expected to increase by 1.5% annually.[58] In our projection we assume that survival and mortality rates remain at the same rate as used in the 2008 calculation. We employ the same method used to estimate losses in productivity for cancer survivors and cancer deaths in 2008, described above, to estimate the losses in 2020.

The projected total cost of cancer in 2020 is £24.72 billion, as seen in the table below. Losses in productivity from cancer increased substantially from their 2008 baseline, totalling £18.18 billion. Losses from cancer deaths accounted for £10.52 billion, while losses from cancer survivors unable to return to work came to £7.66 billion.

The cost of cancer in 2020

Cost component	£ (billion)
Healthcare costs	
NHS costs	5.98
Hospice costs	0.42
Costs to family and patient	0.14
Losses in productivity	
Cancer survivors (paid & unpaid work)	7.66
Cancer deaths (paid & unpaid work)	10.52
Total cost of cancer	**24.72**

The graph below demonstrates the increases in the cost of cancer that will be incurred as the incidence rate continues to climb at 1.5% annually.

Projected societal cost of cancer from 2008 to 2020

£ 24.72 bn

£ 18.33 bn
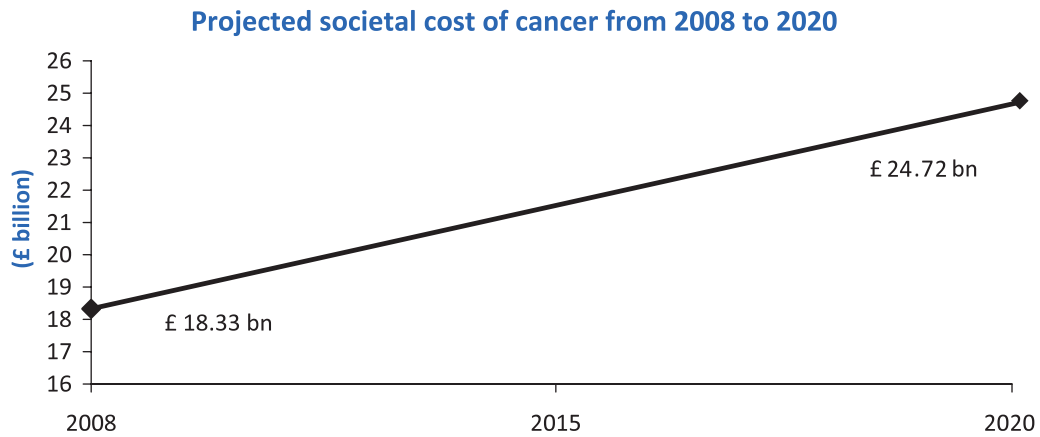
Source: author's calculations.

What if we were among the best in Europe?

The cost of cancer from the societal perspective – like the cost of all other conditions – is important in informing the future prioritisation of healthcare resources, especially if diverting resources to one area within the NHS budget might even result in productivity improvements across the economy. To illustrate how calculating the cost of cancer might be used to inform health policy, we show how the projected societal costs might change if cancer services in England were among the best in Europe.

We base our calculation on a recent study on the avoidable deaths from cancer, which found that up to 11,000 deaths from cancer in England could have been prevented every year if survival rates were at the levels of the best-performing countries in Europe.[59] The British Cancer Journal supplement of January 2009 – focusing specifically on improving early diagnosis - concluded that a large proportion of avoidable deaths are likely to be related to late diagnosis, which results in patients not receiving treatments that would have led to increased survival.[60]

For our best case scenario to 2020, we assume that the 11,000 lives which could be saved every year are distributed across the population in direct proportion to the number of deaths at present and that potential improvements in survival rates are linear from 2008 to 2020.[61] Therefore, if cancer survival rates in England are improved to those of the best-performing countries in Europe, by 2020 we estimate that the societal cost of cancer would reduce by £1.95 billion to £22.77 billion. The cumulative savings by 2015 would be 25,600 lives saved and £4.57 billion in costs, and by 2020 a staggering 71,500 lives and £10 billion in costs.

Projected societal cost of cancer at current and European best survival rates
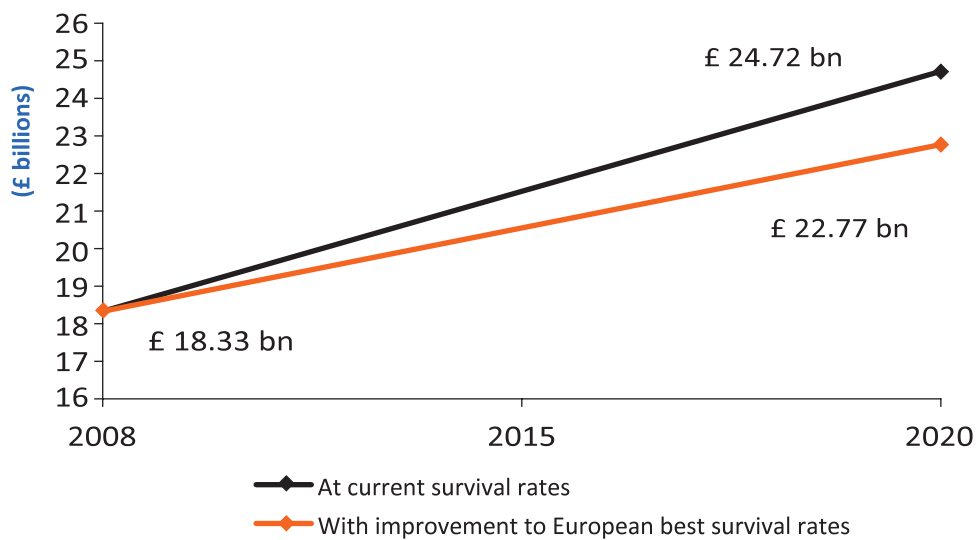
Conclusions & Recommendations

Set against a background of increasing cancer incidence in an ageing population, the Cancer Reform Strategy emphasises the need to improve efficiencies in inpatient care by either decreasing the average lengths of stay or reducing emergency admissions.[62] For example, since around 60% of cancer bed days in the UK relate to emergency admissions there is considerable scope to improve services for patients and reduce costs for the NHS. The Strategy estimates that a 25% reduction in non-surgical admissions for cancer in England would result in savings of £340 million.

It is generally agreed that late diagnosis is the major factor in the UK's poor survival rates compared to Northern and Western European countries.[63] Only a third of new cancer cases in the UK are diagnosed by GP referrals through the urgent 2-week system, leaving the other two thirds to come through non-urgent

referrals, screening and out-patient and emergency hospital visits.[64] Late diagnosis occurs for two main reasons. First, because patients may not recognise the signs and symptoms of cancer thereby leading to low uptake of screening services or late presentation to GPs.[65] Second, because of delays in the primary care environment, which occur for a variety of reasons; for example, inadequate access to diagnostic tests or a failure to recognise cancer symptoms.[66] As a result of these concerns the National Awareness and Early Diagnosis Initiative (NAEDI) was established to address the various factors contributing to late diagnosis.

Tackling the historical inequalities in cancer outcomes, with poor survival rates in deprived areas of the country, should also be a priority for a National Health Service. Programmes which focus on improving awareness of cancer symptoms in deprived communities and therefore promote early presentation are showing positive early results.[67] An interim review of a programme delivered by the Improvement Foundation shows an overall increase in the number of urgent 2-week referrals and that the proportion of new cancer cases diagnosed through the urgent 2-week referral route increased from 43% to 51%. Moreover, the percentage of bowel cancer patients that had no spread of the disease at the time of diagnosis increased from 38% to 43%.

Recommendations:

- The Department of Health should begin a process of benchmarking elements of best practice in cancer services from amongst our European neighbours. This assessment should include patient awareness, early diagnosis, access to new cancer treatments and technology and service configuration.

- When planning future NHS expenditure on different disease areas the Department of Health should consider public priorities and take account of the economic impact of diseases such as cancer. We recommend regular national surveys, as well as further and repeated analysis of the societal cost of cancer.

- The Department of Health should focus NHS attention on improving those areas of cancer services where the largest reductions in mortality can be achieved. These include earlier diagnosis, improving the treatment received by older people and targeting deprived communities, and ensuring the spread of approved treatments and technologies.

- Notwithstanding the importance of early diagnosis and improved access to new treatments and technologies to improve cancer survival rates, we should be clear that prevention, as ever, is better than cure. The most efficacious and cost-effective method for reducing cancer mortality and societal costs is to continue to focus resources and efforts on reducing smoking prevalence.

- Given the importance of early diagnosis to cancer outcomes, we believe the stage of diagnosis should be included in the Quality and Outcomes Framework of the GP contract. One-year survival rates are an effective proxy measure, until accurate staging data becomes available.

Age groups	Estimated number of people surviving a 2008 cancer diagnosis (based on 5-year survival rates)		Estimated number of survivors that do not return to work		Average income (£)		Life time costs of cancer survivors not returning to unpaid work and care (£ million)		Life time costs of cancer survivors not returning to work (£ million)	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
0-14	266	295	46	41	…	…	0.16	1	35	1
15-19	133	147	26	18	8,730	6,177	0.11	.93	27	11
20-24	223	269	38	46	17,607	13,421	0.16	1	37	26
25-29	332	553	76	104	23,340	18,256	0.23	2	74	58
30-34	392	870	89	164	34,899	21,554	0.25	4	83	84
35-39	613	1,580	141	313	34,899	21,554	0.34	6	113	133
40-44	899	2,611	207	518	39,742	20,267	0.46	9	153	200
45-49	1,307	3,482	301	690	39,742	20,267	0.59	11	187	226
50-54	2,271	4,575	1,160	2,248	35,554	19,204	2	35	578	592
55-59	4,223	6,174	2,153	3,034	35,554	19,204	3	38	804	590
60-64	6,463	7,852	3,302	1,632	25,437	13,099	3	35	819	280
65-69	7,778	7,839	963	532	25,437	13,099	2	18	128	36
70-74	8,553	7,698	431	220	25,437	13,099	1	10	33	8
75+	19,486	24,489	…	…	…	…	…	…	…	…
Total	52,939	68,434	8,933	9,566			16	178	3,079	2,197

Methodology

The methodology for this calculation is from the recognised standard texts in health economics: "Methods for the Economic Evaluation in Health Care Programmes" Drummond M, et al. Third Edition, Oxford University Press, 2005; and "Cost-of-Illness Methodology: A Guide to Current Practices and Procedures" Hodgson, TA., and Meiners, MR. The Milbank Memorial Fund Quarterly, Health and Society, vol. 60, no. 3, pp. 429-462, 1982. The data used as a basis for the calculations is published by the Office for National Statistics.

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The work of the Health and Social Care unit at Policy Exchange

For more information on the work of the Health and Social Care unit, please contact Henry Featherstone, Head of Health and Social Care Unit at henry.featherstone@policyexchange.org.uk

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