

Cancer mortality trends: 1992–2020

Projections show that by 2020, almost one in two people will get cancer, but almost four in ten of those will not die from it

Over the past 20 years the nature of cancer has changed. In the early 1990s, people were less likely overall to get cancer than they are today, but also less likely to survive it. Here we estimate how cancer mortality trends have changed over the past 20 years, and how they will develop going forward (see 'About the research' below for details of our methodology).

People are more likely to get cancer

The **proportion** of people in the UK who will get cancer has **increased by more than a third** over the past 20 years.

- In 1992, around one in three people (**32%**) who died that year had been diagnosed with cancer at some point in their lifetime. By 2010, this had risen to more than four in 10 (**44%**)ⁱ, an increase of 38%.

The figure is projected to continue rising over the next decade. By 2020, almost one in two people (47%) will get cancerⁱⁱ (i.e. 47% of those who died that year will have had cancer).

People are more likely to survive cancer

The **proportion** of people in the UK who get cancer who don't die from the disease has **increased by around 70%** over the past 20 years.

- In 1992, around one in five people (**21%**) who had been diagnosed with cancer ultimately died from another cause. By

2010, this had risen to more than one in three (**35%**), an increase of 67%.

The **number** of people who get cancer but die from another cause each year has **doubled** over the past 20 years.

- The number of people who have had cancer but die from another cause has increased from around 45,000 in 1992 to around 90,000 in 2010. The number of people who die from cancer has remained steady, at between 150,000 and 160,000 a year.

The proportion of people who survive cancer will also continue to rise over the next decade. By 2020, **almost four in 10 people** (38%) who have had cancer will die from another causeⁱⁱⁱ.

Other causes of death for people living with cancer

While the majority of people who get cancer will still die from cancer, for those that don't the most common other causes of death are as follows (based on data for Scotland):

- One in five (20%) who do not die of cancer die from ischaemic heart disease
- Another one in five (20%) die from respiratory disease such as pneumonia
- Around one in eight (12%) die from cerebrovascular disease such as stroke^{iv}

These are also the most common non-cancer causes of death for the UK population as a whole^v.

About the research

We have estimated these figures using the best data available, as follows:

- Cancer prevalence (the number of people currently alive who have ever had a cancer diagnosis)
- Cancer incidence (the number newly diagnosed with cancer)
- Cancer mortality (the number of deaths from cancer)
- Total mortality (the number of deaths from all causes)

For a given time period (t), if we know the increase in prevalence during that time (p_{it}), and the number of people newly diagnosed with cancer (i_t) and cancer deaths (d_{ct}), we can estimate the number of non-cancer deaths (d_{nct}) and hence quantify the number of people who die who have had a cancer diagnosis during that time period. We also know total mortality (d_t) so can estimate the proportion of those who die who had had a cancer diagnosis.

We used the following sources of information for these estimates:

- Prevalence:
 - Data for 1992: Forman et al^{vi}
 - Data for 2010 to 2020: Maddams et al^{vii}
- Incidence and mortality:
 - Data on cancer incidence, cancer mortality and all-cause mortality for the UK from 1992 to 2010^{viii}
 - All-cause mortality projections for the UK from the Office for National Statistics (ONS) from 2011 to 2030^{ix}

Cancer incidence and mortality projections assume trends from 2000 to 2010 continue at the same rate^x.

Incidence data has been adjusted to account for the small proportion of people who get two or more primary diagnoses of cancer^{xi}.

The calculation is as follows:

Deaths for people with a cancer diagnosis (all cancers combined) in the year 2010 (t):

$$\begin{aligned} \rightarrow d_{nct} &= i_t - p_{it} - d_{ct} \\ \rightarrow d_{nct} &= 308,000 - \mathbf{65,000} - 157,000 = \\ &\mathbf{86,000} \end{aligned}$$

Proportion of people who died in the year 2010 who had had a cancer diagnosis at some point in their lifetime:

$$\begin{aligned} \rightarrow &(d_{ct} + d_{nct}) / d_t \\ \rightarrow &(157,000 + \\ &\mathbf{86,000}) / 561,000 \\ \rightarrow &\mathbf{44\%} \end{aligned}$$

Proportion of people with a cancer diagnosis who died from their cancer in the year 2010:

$$\begin{aligned} \rightarrow &d_{ct} / (d_{ct} + d_{nct}) \\ \rightarrow &157,000 / \\ &(157,000 + \mathbf{86,000}) \\ \rightarrow &\mathbf{65\%} \end{aligned}$$

Note: Figures in **bold** have been estimated or calculated based on estimates.

Quality of the data

These estimates are based on a calculation that uses some modelled or estimated data along with assumptions about the rate of change in these data. To check the validity of our analysis, we compared our estimates for the UK as a whole to actual data available for London for 1998 to 2010^{xii,xiii} and for Scotland for 1992 to 2010^{xiv}. Our overall trends align with these data, however there are differences in the proportions and rate of change, which may be explained by regional differences.

While our analysis uses the best available data at this point in time, we would encourage improved recording of cause of death for people with cancer and will review these figures as and when more information becomes available.

ⁱ As the proportion of people getting cancer is increasing, the current figure of 44% is likely to be an underestimate of the true risk facing people alive today. Macmillan estimate based on; Maddams J, Utley M, Møller H. Projections of cancer prevalence in the United Kingdom, 2010-2040. *Br J Cancer* 2012; **107**: 1195-1202. (Scenario 1) Forman D, et al. Cancer prevalence in the UK: results from the EUROPREVAL Study. *Annals of Oncology*. 2003. 14: 648–654; Office for National Statistics; Information Services Division (ISD) Scotland; General Registrar Office Scotland; Welsh Cancer Intelligence & Surveillance Unit; Northern Ireland Cancer Registry; Northern Ireland Statistics and Research Agency

ⁱⁱ Macmillan estimates based on; prevalence projections to 2030 from Maddams J, Utley M, Møller H. Projections of cancer prevalence in the United Kingdom, 2010-2040. *Br J Cancer* 2012; **107**: 1195-1202. (Scenario 1) ; Incidence and mortality (cancer) projections estimated to 2030 assume trends from 2000 to 2010 continue at the same rate (except for prostate cancer where static incidence rates were assumed from 2009 to 2030) in line with prevalence projections. 2000 to 2010 data are provided by Office for National Statistics (England); Information Services Division (ISD) Scotland; General Registrar Office Scotland; Welsh Cancer Intelligence & Surveillance Unit; Northern Ireland Cancer Registry; all cause mortality projection estimates to 2030 taken from Office for National Statistics (UK). For prostate cancer incidence projections, 2009 incidence rates (UK) by broad age group taken from the UKCIS were applied to population projections (UK) from Office for National Statistics to project incidence to 2030.

ⁱⁱⁱ Macmillan estimate based on data noted above (ii).

^{iv} Personal Communication: Scottish Cancer Registry, ISD; death data is primarily from National Records of Scotland (NRS) Data extracted: April 2013

^v Office for National Statistics. England and Wales, all deaths. <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-276695> (accessed April 2013). General Register Office for Scotland. Deaths – causes. <http://gro-scotland.gov.uk/statistics/theme/vital-events/general/ref-tables/2011/section-6-deaths-causes.html> (accessed April 2013). Northern Ireland Statistics and Research Agency. Deaths by causes. <http://www.nisra.gov.uk/demography/default.asp14.htm> (accessed April 2013).

^{vi} Forman D, et al. Cancer prevalence in the UK: results from the EUROPREVAL Study. *Annals of Oncology*. 2003. 14: 648–654

^{vii} Maddams J, Utley M, Møller H. Projections of cancer prevalence in the United Kingdom, 2010-2040. *Br J Cancer* 2012; **107**: 1195-1202. (Scenario 1 presented here)

^{viii} Incidence trends in the UK 1992 -2010 for all cancers excl nmsc from Office for National Statistics for England personal communication (May 2012); Welsh Cancer Intelligence & Surveillance Unit (personal communication) (May 2012);

Scottish Cancer Registry, ISD (2012) Cancer Incidence in Scotland (2010) <http://www.isdscotland.org/Health-Topics/Cancer/Publications/data-tables.asp?id=839#839> (accessed June 2012); Northern Ireland Cancer Registry (2012) Online Statistics - Incidence & Survival 1993-2010 <http://www.qub.ac.uk/research-centres/nicr/CancerData/OnlineStatistics/AllCancersExcNM/S/> (accessed June 2012); Mortality trends (cancer deaths & all deaths in the UK 1992-2010); Office for National Statistics personal communication (cancer deaths C00-C97 & all deaths); England and Wales; Scottish Cancer Registry, ISD (2012) Cancer mortality in Scotland (2010) (C00-C96 excl nmsc) <http://www.isdscotland.org/Health-Topics/Cancer/Publications/data-tables.asp?id=630#630> (accessed June 2012), General Register Office for Scotland. All deaths by sex Scotland <http://www.gro-scotland.gov.uk/statistics/theme/vital-events/deaths/time-series.html> (accessed June 2012); Northern Ireland Cancer Registry (2012) Online Statistics - Mortality 1993 to 2010 (C00-C97) <http://www.qub.ac.uk/research-centres/nicr/CancerData/OnlineStatistics/AllCancers/> (accessed June 2012), Northern Ireland Statistical & Research Agency. All deaths. <http://www.nisra.gov.uk/demography/default.asp10.htm> (accessed June 2012). Cancer incidence and mortality data are only available from 1993 from Northern Ireland so this was crudely extrapolated backwards to 1992.

^{ix} Office for National Statistics. National Population Projections, 2010 based <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-229866> (accessed March 2013)

^x 2000 to 2010 data are provided by Office for National Statistics (England); Information Services Division (ISD) Scotland; General Registrar Office Scotland; Welsh Cancer Intelligence & Surveillance Unit; Northern Ireland Cancer Registry. For prostate cancer incidence projections, 2009 incidence rates (UK) by broad age group taken from the UKCIS were applied to population projections (UK) from Office for National Statistics to project incidence to 2030.

^{xi} Sasieni P.D, et al. What is the lifetime risk of developing cancer? the effect of adjusting for multiple primaries. *British Journal of Cancer*. 2011. 105: 460 – 465 <http://www.nature.com/bjc/journal/v105/n3/pdf/bjc2011250a.pdf> (accessed August 2012)

^{xii} Thames Cancer Registry. Year reports 1998 to 2010. Cancer in South East England. <http://www.thames-cancer-reg.org.uk/bulletin/reports.htm> (accessed October 2012)

^{xiii} Office for National Statistics. Death registrations London SHA 1998 to 2010. <http://www.ons.gov.uk/ons/publications/all-releases.html?definition=tcm:77-27475> (accessed October 2012)

^{xiv} Personal Communication: Scottish Cancer Registry, ISD; death data is primarily from National Records of Scotland (NRS) Data extracted: April 2013