COUNTING 20 YEAR CANCER PREVALENCE IN THE UK

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A new way of counting cancer prevalence to understand the prevalence of multiple primaries in the UK

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Background

An estimated 2.5 million people are living with and beyond cancer in the UK, predicted to increase to 4 million by 2030[1]. The Macmillan-NCIN UK Cancer Prevalence Project aims to provide the most granular understanding of the cancer survivorship population in the UK.

Previous cancer prevalence analyses have largely been based on a person count and a 'first diagnosis only' method, but second and subsequent cancer diagnoses present new treatment and support needs. We aim to capture the prevalence of people diagnosed with more than one type of primary cancer within a specified 20-year period.

Methods

We used the Public Health England National Cancer Data Repository to link UK cancer registrations to mortality records in order to identify people diagnosed with cancer between 1991 and 2010[2] and still alive on 31st December 2010.

We calculated 20-year cancer prevalence based on the first diagnosis of any cancer in the 20-year time period[3]. We then identified second or subsequent diagnoses of a different cancer site within the 20-year period[4].

Results

Breast, colorectal, prostate and lung cancers had the highest absolute numbers of second and subsequent cancer diagnoses of a different cancer site in the 20-year period 1991–2010 (figure 1). The highest proportions of second and subsequent cancer diagnoses of a different cancer site within the 20-year period were found for lung, pancreatic, liver, uterus and stomach cancers. Overall, the lowest proportions were found for cervical cancer, Hodgkin lymphoma, prostate cancer and breast cancer.

There were 480,766 females living with and beyond breast cancer in 2010, with an additional 10,000 female survivors living with breast cancer as a second or subsequent cancer diagnosis, having previously been diagnosed with another type of cancer within the 20-year period.

One in 24 colorectal cancer survivors, or around 9,400 people, had a previous cancer diagnosis of a different site within the 20-year period.

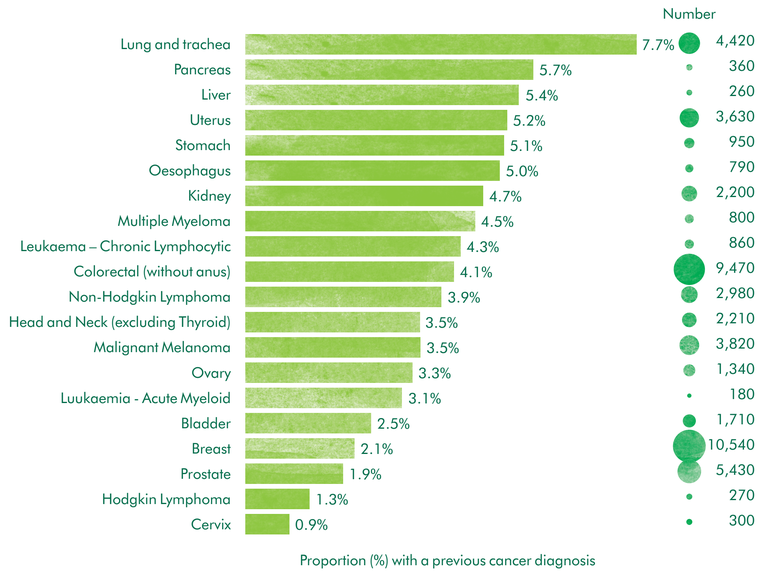

Figure 1: Proportion and number[6] of cancers which were a second or subsequent diagnosis of a different cancer site within the 20-year period[2] for people living with and beyond cancer in the UK in 2010, by cancer type

Lung cancer saw the highest proportion of second and subsequent cancer diagnoses out of the 20 common cancer sites analysed here[5]. Almost 8% of lung tumours registered were in people previously diagnosed with a cancer of a different site, within the 20-year period. This equates to around 4,400 people, or 1 in 13 people living with and beyond lung cancer who previously received a cancer diagnosis of a different site in the period 1991–2010.

Of more than 65,000 women living with and beyond uterus cancer, around 3,600, or over 5%, had received a previous cancer diagnosis of a different site. So for 1 in 19 women who were living with uterus cancer in the UK, this was their second or subsequent cancer of a different cancer site in the 20-year period.

Some of the cancers that are proportionally most likely to be second or subsequent cancers – lung, pancreatic and liver cancers– correspond to some of cancers with the poorest prognosis.

There was some variation of the proportion of second or subsequent cancers between the nations within the UK, particularly for Northern Ireland, Scotland and Wales (figure 2).

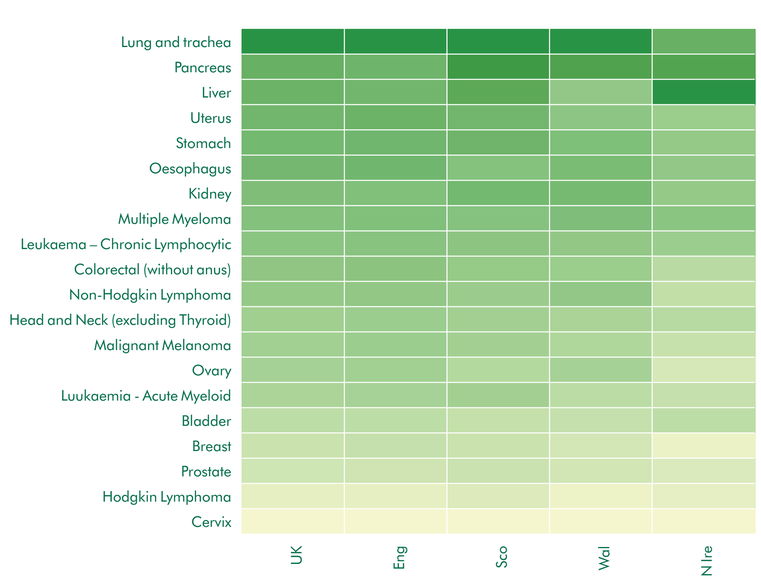

Figure 2: Heatmap highlighting cancer types with the highest proportion[6] of second or subsequent cancers of a different site within the 20-year time periond[2] for each nation in the UK in 2010

Lung cancer had the highest proportion of second or subsequent diagnoses for three UK nations: England, Scotland and Wales. In Northern Ireland, however, it was found that liver cancer survivors were most likely to have had a previous cancer diagnoses, and that pancreatic cancer survivors were the second most likely to have had a previous cancer diagnosis[6].

Wales, Scotland and Northern Ireland all had, on average, higher proportions of secondary or subsequent cancer diagnoses than England. Some of the biggest differences were for pancreas, lung, and liver cancers.

The results also suggest that females are more likely than males to have had a previous cancer diagnosis; this was apparent across all reported cancer sites (excluding sex-specific cancers) (Figure 3).

Females living with the following cancers were at least twice as likely as men to have had a previous cancer diagnosis of a different cancer site: kidney cancer, bladder cancer, and Hodgkin lymphoma.

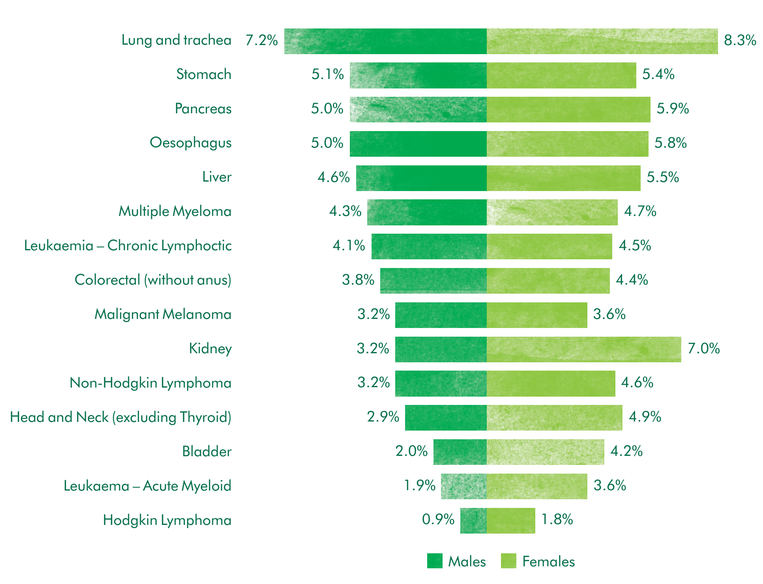

Figure 3: Variations in the proportion of cancers[6] which are a second or subsequent diagnosis of a different cancer site within the 20 year period[2] , for males and females living with and beyond cancer in the UK in 2010

Conclusions and limitations

This first-stage analysis has proven useful in informing us about multiple primary tumours. However, the nature of the extracted dataset used for this stage of the cancer prevalence project has substantial limitations, so that we can derive only limited information about multiple primary cancer diagnoses. The cancer diagnoses in our analysis are based on the 20-year finite time period 1991–2010, thus not capturing pre-1991 and post-2010 diagnoses. Our dataset only counts subsequent diagnoses of different cancer sites, and not of the same cancer site. Our analysis is also only based on analysing some of the most common cancer sites.

Even with these limitations in mind, our initial findings are thought-provoking. For example, the cancer sites with the highest proportions of second or subsequent diagnoses of a different cancer site tended to be the those cancers more associated with socio-economic and lifestyle risk factors such as smoking, alcohol and diet. Shared risk factors may explain some of the variation between the nations where, for example, there are higher smoking rates in Wales and Scotland and a correspondingly higher number of lung cancer cases in these nations[7].

Although women living with cancer are more likely to have had a previous cancer diagnosis of a different cancer site than men living with cancer within the 20-year period, this may be due to the larger number of women living and surviving specific cancer diagnoses, most notably breast cancer. Treatment effects and lifestyle or genetic factors may also contribute to these findings, but more investigation is needed about these sex-related differences.

For the next stage of the UK Cancer Prevalence Project we will investigate multiple primary tumours in more detail. This will involve further analysis of the cancer registrations data, which are based on a longer period of time (not just the 20 years). We will explore all second and subsequent cancers (not just the second and subsequent diagnoses of a different cancer site). We will also explore further the findings and the context of these data by discussing the information with experts, comparing our findings with other studies and having a deeper understanding of cancer registration practice.

For more information please contact Samuel Jones, evidence@macmillan.org.uk

Acknowledgements
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N. Ireland Cancer Registry

GIG CYMRU NHS WALES | Iechyd Cyhoeddus Cymru Public Health Wales
Uned Deallusrwydd a Gwyliadwriaeth Canser Cymru
Welsh Cancer Intelligence and Surveillance Unit

NHS National Services Scotland

References and notes:
1 Maddams J, Utley M, Møller H. Projections of cancer prevalence in the United Kingdom, 2010-2040. Br J Cancer 2012; 107: 1195–1202. (Projections scenario 1). Macmillan analysis based on extrapolation of 2010 and 2020 projections that the number of people living with cancer will hit an estimated 2.5 million in 2015.
2 Northern Ireland data is based on cancer registrations collected for people diagnosed within cancer between 1993 and 2010
3 So a woman diagnosed with breast cancer in 1992 and then breast cancer again in 2001 will be counted only once in the breast cancer site figures; however, should she instead be diagnosed with breast cancer in 1992 and lung cancer in 2001, she would be counted in both breast and lung cancer figures.
4 However, the data cannot tell us the chronology of cancer diagnoses
5 Data tables available at NCIN (http://www.ncin.org.uk/about_ncin/segmentation). Please refer to the supporting information on ICD-10 codes
6 Figures presented here are based on suppressed data and may differ to other reported findings. Figures which refer to the number of second or subsequent cancers have been rounded and are approximate.
7 Caution should be taken when comparing cancer data from different registries due to differences in data collection. Previous studies coordinated by the International Agency for Research on Cancer (IARC) found that Scottish rates of secondary primaries were similar to other (non-UK) cancer registries