Use of the flow method to estimate trends in completeness of registration at the Thames Cancer Registry

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Introduction

Completeness of case ascertainment is an important measure of data quality for cancer registries. Quite apart from the obvious consequences for the accuracy of cancer incidence statistics, incompleteness can also have adverse effects on cancer survival estimates. [1] This is because 'missed' cases are often those with long survival, who eventually die of causes unrelated to their cancer.

Several methods have been suggested for estimating completeness. Many of these are indirect or 'surrogate' methods, such as the ratio of mortality to incidence or comparisons with previous years. They are generally unreliable, and do not answer the question they are meant to be addressing – they measure consistency, rather than completeness. More direct methods, such as case re-abstraction or capture-recapture techniques, are available but tend to be labour intensive or time consuming, and often contain an element of subjectivity. None of these methods takes into account the dimension of time.

The flow method [2] was developed in an attempt to overcome these shortcomings by modelling the flow of individuals through the case ascertainment process from diagnosis to registration, thus producing an estimate of completeness as a function of time since diagnosis.

This study uses the flow method to examine trends in completeness of cancer registration at the Thames Cancer Registry (TCR) over a 12-year period.

Methods

To perform an analysis the flow method requires two datasets: a file of cases diagnosed within a given time period (typically a specific year); and a file of cases who died in a subsequent specified period (irrespective of when they were diagnosed). To examine trends over time, we ran the model on thirteen pairs of datasets, each pair consisting of a file of cases diagnosed in a given year (from 1992 to 2004) plus a file of deaths which occurred four years later (from 1996 to 2008).

Results

During the period 1992 to 2004 the proportion of death-certificate-only (DCO) cases at TCR decreased from a maximum of 22% in 1994 to 4% in 2004 (Figure 1). Estimated 5-year completeness for all cancers (excluding non-melanoma skin cancer) and both sexes combined increased from 92% to 94% over this period (Figure 2). In particular, there has been a steady and significant increase in completeness over the most recent three-year period.

Figures 3 and 4 compare estimates of completeness at 1, 2, 3, 4 and 5 years after diagnosis between the earliest period (1992 diagnoses) and the most recent (2004 diagnoses). For female breast cancer (Figure 3), estimated 5-year completeness increased from 89.3% to 93.6%. Moreover, there was an accompanying improvement in timeliness of registration for this cancer, in that estimated completeness at 1, 2, 3 and 4 years after diagnosis all increased.

By contrast, 5-year completeness for prostate cancer decreased slightly between the two periods, from 88.7% to 87.6%, with a large difference (58.6% vs. 48.0%) in estimated completeness at 1 year post diagnosis – suggesting that prostate cancer cases are taking longer to be recorded.

Figure 1: Trend in proportion of DCO cases - all cancers

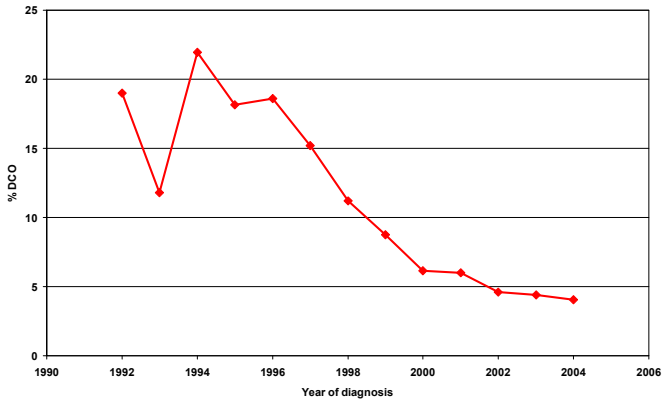


Figure 2: Trend in estimated 5-year completeness - all cancers

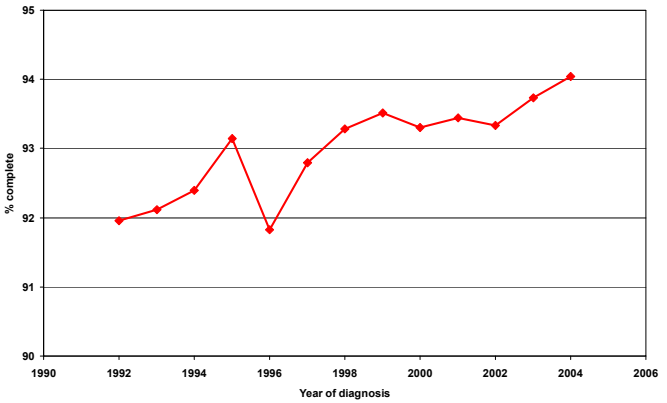


Figure 3: Completeness estimates - female breast cancer

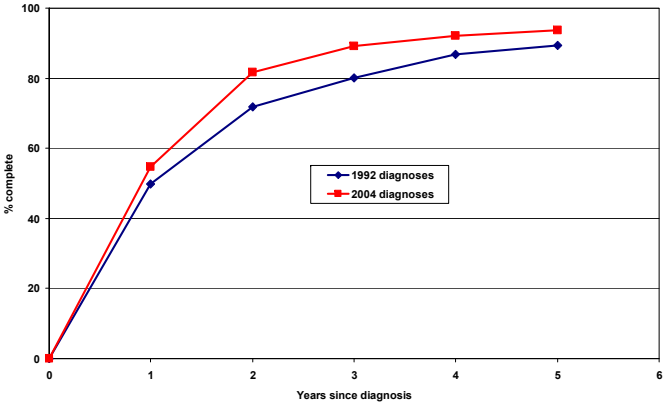
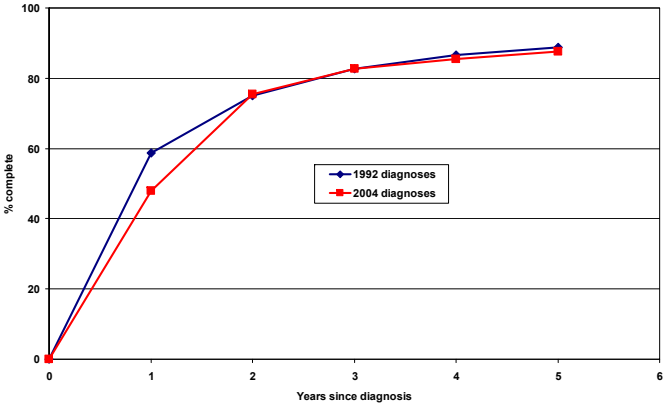


Figure 4: Completeness estimates - prostate cancer



Conclusions

In general, completeness at TCR as measured by this method has improved over the period of study. The recent sharp increase in completeness seen since 2002 coincides with modernisation of the registration processes used at TCR, and in particular the introduction of electronic pathology reports. We would expect to see further increases as these methods become more widely used. However, there are some cancers for which completeness has not increased. The flow method makes it easy to perform such trend analyses, and to compare performance between different types of cancer.

References

1. Robinson D, Sankila R, Hakulinen T, Møller H. Interpreting international comparisons of cancer survival: The effects of incomplete registration and the presence of death certificate only cases on survival estimates. Eur J Cancer 2007; **43:** 909-913.

2. Bullard J, Coleman M P, Robinson D, Lutz J-M, Bell J, Peto J. Completeness of cancer registration: a new method for routine use. Br J Ca 2000; **82:** 1111-1116.