LETTER TO THE EDITOR

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Reply to 'Comment on Cancer incidence in the United Kingdom: projections to the year 2030'

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Sir,

We would like to thank Oliver *et al* (2013) for bringing to our attention these data issues. After careful checking, it is clear that the main source of discrepancy is the difference between the numbers of cancer registrations for 2004–2007, as available in 2010, and the updated numbers released in 2011. Whereas we were aware that there can be substantial delays in registration of some cancers, we had assumed that any changes made after the data are first published would be trivial at a population level and would not affect the analysis of trends over time. Unfortunately, we were wrong. Our projections for leukemia, in particular, are likely to have substantially underestimated the future burden of the disease.

Consider the numbers of all cancers (excluding non-melanoma skin cancer) in 2004 in England; according to the MB1 no. 35 (released: 19 December 2006), there were 233 621 cancer cases, but updated statistics released in 2011 recorded 241 700 cases – an increase of 3.3%. The change is particularly great for leukemia (ICD-10: C91–C95; 10.5%) and myeloma (C90; 8.8%). In Table 1, we show how the age-standardised rates of leukemia for each year between 2005 and 2009 has increased in successive data releases. The increase in rates as the data matures will severely distort recent trends and will attenuate projections downwards.

Table 1. Age-standardised rates (per 100 000 person years) for leukaemia (C91–95) in England as estimated in successive annual data releases

	Years since first published					
	0	**1**	**2**	**3**	**4**	**5**
Year of diagnosis						
2005	9.6	10	10.2	10.4	10.5	10.5
2006	9.6	10.1	10.4	10.6	10.6	
2007	9.2	9.7	9.9	10		
2008	9.9	10.4	10.6			
2009	10.6	11.2				

Table 2. Change in cancer registrations for 2004 (England) between 2006 and 2011

	ICD-10 code	Males (%)	Females (%)
Type			
All cancer	C00–C97	3.7	3.0
Bladder	C67	2.5	1.7
Brain and CNS	C70–C72	2.6	3.7
Breast	C50		2.8
Cervix	C53		2.4
Colorectal	C18–C21	2.5	2.6
Kidney	C64–C66 + C68	5.8	4.1
Leukaemia	C91–C95	10.2	10.9
Liver	C22	7.4	3.3
Lung	C33–C34	2.5	3.3
Melanoma	C43	4.6	3.6
Myeloma	C90	9.0	8.6
Non-Hodgkin lymphoma	C82–C85 + C96	4.3	4.4
Oesophagus	C15	0	1.2
Oral (lip, mouth and pharynx)	C00–C14	1.9	0.9
Ovary	C56–C57		5.2
Pancreas	C25	2.8	3.8
Prostate	C61	5.6	
Stomach	C16	2.1	1.9
Testis	C62	2.8	
Uterus (corpus and unspecified)	C54–C55		2.3

Abbreviation: CNS = central nervous system.

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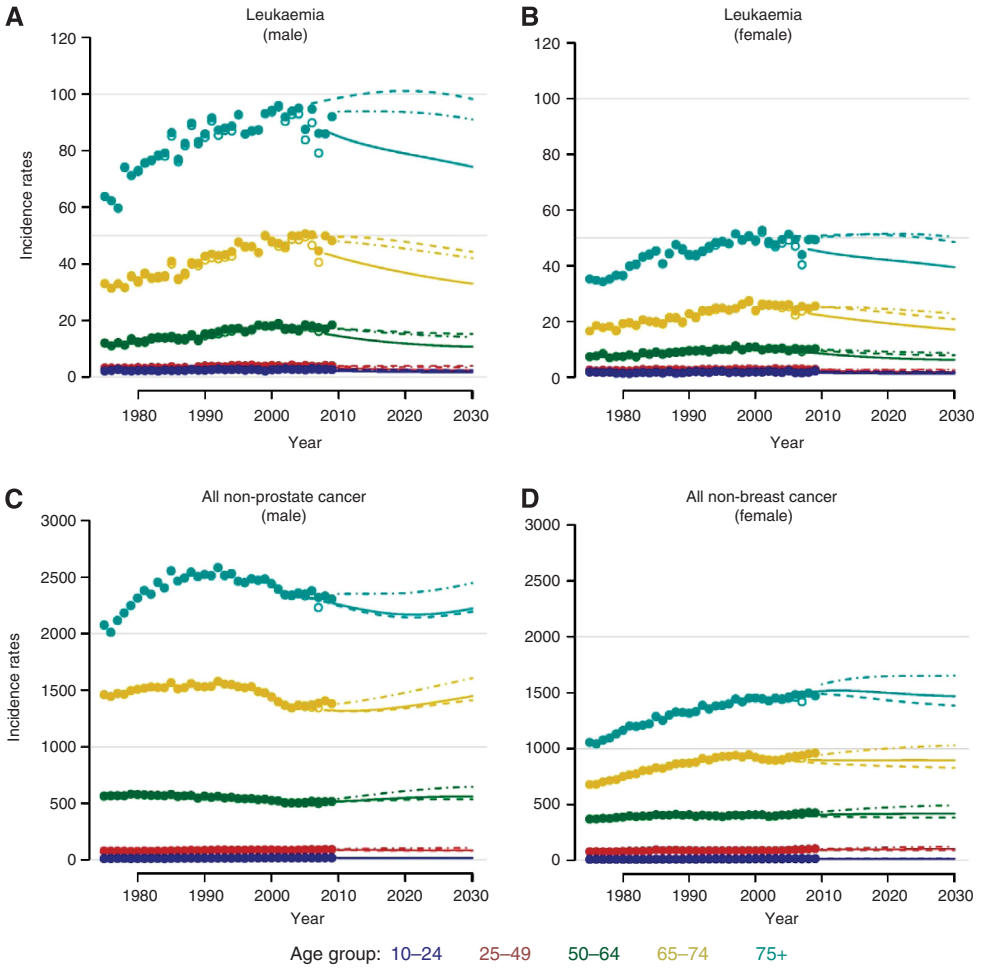

Figure 1. Observed and projected rates of cancers in Great Britain based on three different data sets. (**A**) Leukaemia (male). (**B**) Leukaemia (female). (**C**) All non-prostate male cancers. (**D**) All non-breast female cancers. Rates per 100 000 are age-standardised within age-bands. Rates released in 2010 (old data) are solid circles, rates release in 2011 (new data) are open circles (they are mostly indistinguishable). Projections using the old data (1975–2007) are solid, those using the new data (1975–2005) are dashed, and those using the new data (1975–2009) are dash-dotted.

Table 3. Projected (European) age-standardised rates (per 100 000) for 2030 of haematological cancers based on various data sets

As published	**Mistry *et al* (2011)**	**Oliver *et al* (2013)**	**New estimates**		
Data set	GB	England	GB	GB	GB
Year of release	2010	2012	2011	2011	2011
Years of data used	1975–2007	1984–2009	1975–2005	1975–2007	1975–2009
Non-Hodgkin lymphoma					
Male	17.1	19.7	16.4	19.0	20.6
Female	10.1	14.5	9.9	11.3	13.8
Myeloma					
Male	5.1	9.7	6.4	6.3	8.5
Female	3.3	5.7	4.0	4.2	4.9
Leukaemia					
Male	9.1	14.9	12.6	11.0	11.6
Female	5.4	8.9	6.8	6.6	7.3
Non-prostate male cancers	327.6	—	317.3	356.8	370.8
Non-breast female cancers	239.0	—	220.1	260.5	277.2

Abbreviation: GB = Great Britain.

Statistical methods for predicting the eventual number of registrations for each of the last few years deserve a separate investigation, but any approach will need to take into account the changing methodology used in cancer registration, as that will have lead to more timely registration of many tumours. We urge the Office for National Statistics to consider publishing estimated 'complete registration' data using, for instance, the method adopted by the Surveillance, Epidemiology and End Results (Midthune *et al*, 2005), who published both unadjusted and delay-adjusted rates (National Cancer Institute, 2012). Here we simply note that the issue is present for virtually all cancer sites to a greater or lesser extent, but appears to be independent of sex and age for any given site (Table 2).

We have analysed the most recently released data and made projections to 2030 using all data up to 2009, and also limited the analysis to data between 1975 and 2005. The resulting fits for leukemia are shown in Figure 1, together with our previously published results based on the data from the 2010 release for 1975–2007. It is seen that the old data yield particularly optimistic projections, but by including the most recent 4 years of the new data the projections are more optimistic than when these data are excluded. We have also projected all cancers (excluding non-melanoma skin cancer) other than prostate cancer in men and all cancers other than breast cancer in women, treating them as a single site. The reason for the exclusion of prostate and breast cancer is that their incidence has been hugely affected by PSA testing and screening mammography so that the age-period cohort model does not provide a reasonable fit. Our projections based on the 2010 data are very similar to those using the 2011 data for 1975–2005, but are somewhat lower than those that include data for 2006–2009 (Figure 1). The projections using data only up to 2005 are more than 10% lower than those including data for 2006–2007, and projections including data up to 2009 are about 5% greater still (even without adjusting for late registration bias).

Table 3 summarises the effect of using different data sets on age-standardised projections for 2030 for leukaemia, non-Hodgkin lymphoma, myeloma, and for all non-prostate male cancers and non-breast female cancers. The increase in projected rates for 2030, although not quite as great as obtained by Oliver *et al* (2013), is substantial (about 11% for non-Hodgkin lymphoma and 20–25% for leukemia and myeloma). The projected rates for all non-prostate and non-breast cancers for 2030 are about 9% greater using the new data than they are using the old data (in both cases for 1975–2007).

In summary, late registrations, particularly of haematological cancers, have a profound effect on observed trends in cancer incidence and should be taken into account when projecting future rates.

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