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Do awareness months affect the coverage of common cancers in UK national newspapers?

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ABSTRACT

Objective: To determine whether the newspaper coverage of the four most common cancers relates to their national awareness months and relative burden, and to identify the subject focus during high coverage periods.

Design: Longitudinal study using the Nexis newspaper article database.

Setting: United Kingdom 2011-2012.

Outcome measures: Annual number and ranking, monthly proportions and subject of articles on breast, lung, colorectal and prostate cancers.

Results: 9178 articles were identified during 2011 and 2012 featuring breast (4237), prostate (1757), lung (1746) and bowel (1438) cancer. Peaks in monthly proportions above the 99% upper confidence limit were identified for each. Breast cancer had the highest coverage of 12% and 17% during its awareness month. Smaller peaks (11%) were identified during Bowel Cancer Awareness month. Prostate cancer received high coverage in relation to the case of the man convicted of the Lockerbie bombing who had been diagnosed with the cancer, and lung cancer in relation to the deaths of celebrities. Breast cancer was covered most often overall by all newspaper types while the lower coverage of other cancers did not consistently reflect the relative number of new cases each year.

Conclusions: UK newspaper coverage of breast cancer and bowel cancer appear influenced by their awareness months while prostate and lung cancer are influenced by other media stories. Coverage of common cancers other than breast appears under-represented relative to their population burden. Health promoting public bodies and campaigners could learn from the success of Breast Cancer Awareness Month and work more closely with journalists to ensure relevant messages reach wider audiences.

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ARTICLE SUMMARY

Key messages

- UK newspaper coverage of breast and bowel cancer in 2011 and 2012 was high during their awareness months, suggesting that cancer advocates had been more successful in reaching journalists with stories about these cancers than for lung and prostate cancer.
- Breast cancer received high coverage throughout the study period, consistent with the high number of cases diagnosed, while lung, prostate and bowel cancers were under-represented relative to their population burden. This suggests that cancer advocates and health promoting bodies need to find ways of increasing the media exposure of these cancers.
- Many newspaper articles used personalisation and celebrity stories about cancer to attract their audiences. These could represent an opportunity for journalists and health-promoting bodies to work together on including accurate and relevant population health messages.
- Media and awareness campaigns may prove to be an effective method of increasing knowledge and health behaviours around prevention, but more research on their effectiveness at promoting early diagnosis is required.

Strengths and limitations

This study made novel use of an established comprehensive database and classification tool to identify the subject focus of newspaper articles. While this method allows a large number of articles to be assessed and to replicate and monitor the findings over time, content analysis would reveal the more detailed messages and themes within them. National newspapers are a widespread form of media but others such as magazines, television, radio, online news and social media are not included and should be considered.

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INTRODUCTION

Awareness months are increasingly used by charities and other non-profit and public organisations to raise the profile of particular diseases, spread information about early symptoms or detection and raise funds for research or treatment. A leading example is Breast Cancer Awareness Month which was introduced to the United Kingdom by the charity Breast Cancer Care in 1993.[1] Bowel Cancer Awareness Month was established later in 2000,[2] followed by Lung Cancer Awareness Month in 2002[3] and Prostate Cancer Awareness Month in 2009.[4]

Given that most people do not meet medical professionals regularly the media is a valuable means of raising public awareness and knowledge about cancer and disseminating health information in general. However, journalists often need to deliver a story with 'human interest' which can mean cancer news items may be biased towards personal accounts and risk distorting perceptions of the disease burden in populations.[5] For example, stories about young female celebrities with cancer may create a false perception that the disease affects younger women more often than older women, such as the 'Kylie effect' resulting from the diagnoses of Australian singer Kylie Minogue aged 36.[6] The attention the UK media gave to the diagnosis of the celebrity Jade Goody with cervical cancer and her wish to raise awareness of screening led to a national debate about its effectiveness in young women,[7] and an increase in screening coverage and information seeking.[8, 9] Aside from celebrity stories, media campaigns have been shown to influence cancer-related behaviours such as increasing cancer screening uptake in the US and Australia,[10-12] and reducing the use of sunbeds in Denmark.[13]

National newspapers are one widespread medium for cancer awareness but no study has yet evaluated whether awareness months affect cancer coverage in the United Kingdom. This study aimed to quantify national newspaper coverage of the four most commonly diagnosed cancers and to determine whether it related to their national awareness months and relative population burden in the United Kingdom. It also aimed to identify the subject focus of the articles published during awareness months or other high coverage periods.

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METHODS

Breast, lung, prostate and bowel cancer were chosen for this study as the four most commonly diagnosed cancers which collectively accounted for over 50% of diagnoses in the United Kingdom in 2010.[14] Data were extracted from the well-established, searchable, news article database Nexis UK.[15] The newspaper articles were identified by the keywords 'breast cancer', 'lung cancer', 'prostate cancer', 'bowel cancer', 'colorectal cancer', 'colon cancer' and 'rectal cancer'. The search was limited to newspaper articles published in 2011 and 2012 under the source category 'UK National Newspapers' and duplicates were eliminated. The national newspapers that the database included under this category were grouped into three categories, tabloid (Daily Star, Morning Star, The Mirror, The Sunday Mirror, The People and The Sun), middle-market (Daily Mail, The Mail on Sunday, The Express and The Sunday Express) and broadsheet (The Daily Telegraph, The Sunday Telegraph, The Guardian, The Observer, i, The Independent, Independent on Sunday, The Times and The Sunday Times).

The number of articles covering each cancer type was first determined. Within each study year the proportion of articles was plotted by month of publication. High proportions were identified as those above the 99% upper confidence limit for the mean by cancer type and publication year. These were then matched to the cancer awareness months – March for prostate, April for bowel, October for breast and November for lung cancer. Population burden was measured as the number of newly diagnosed cases in 2010 – the year for which the most recent statistics were available.

The subject focus of each article was assigned by Nexis using the LexisNexis SmartIndexing Technology™ which is a classification system that is able to analyse and tag online articles with relevant subjects.[16] At the beginning of 2013 there were 19 main subject areas which were further divided into 191 more specific subjects and articles may have been tagged with more than one subject (table 1). Peaks in coverage that were above the 99% upper confidence limit were examined further to identify the main subjects or events which may have contributed to the rise.

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RESULTS

A total of 9178 articles relating to the four most commonly diagnosed cancers in the United Kingdom were identified for the study period with a similar number published in each year. In both years breast cancer and bowel cancer were consistently the most and least covered cancers and this reflected their ranking in terms of number of newly diagnosed cases (table 2). Generally the five main subject areas for all articles about each of the cancers were 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections'.

Coverage of breast cancer was the most frequent in both years with a total of 4237 articles. Peaks in its coverage were in July and October 2011, and October 2012 (figure 1). Coverage in July 2011, which made up 11% of the published articles in that year, had a high proportion of articles tagged under the subject area 'Sports & Recreation'. These articles referred to the case of a golf champion's wife who had died from breast cancer. October 2011 and 2012 had the highest proportions of coverage, 12% in 2011 and 17% in 2012, which coincided with Breast Cancer Awareness Month. The subject focus of these articles was still concentrated around the top five main subject areas.

Prostate cancer was the second most frequently mentioned cancer overall, being covered by 1757 articles. The proportions peaked in February, August, and September 2011 at around 10%, and April and May 2012 at 14% (figure 1). These peaks all had a notable proportion of articles tagged under the subject area 'International Relations & National Security' and these were mainly associated with the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. None of these peaks coincided with Prostate Cancer Awareness Month which takes place in March.

Lung cancer followed closely with 1746 articles over the two years. Peaks in the proportions of articles were identified in March, July and October 2011 at around 10% (figure 2). In 2012 peaks were observed in May and December at over 11%. March 2011 saw a rise in articles relating to 'Government & Public Administration', which were generally concerned with articles relating to compensation for victims of asbestos exposure. July 2011 saw a rise in articles that were confined to the top five main subject areas. There was also a rise in articles tagged under the subject area

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'Humanities & Social Sciences' for the months October 2011, May and December 2012; these were mainly covering stories about deaths from lung cancer, particularly of celebrities. There were no peaks in coverage observed during the cancer awareness month in November.

Bowel cancer was covered by 1438 newspaper articles during the study period. The peaks in proportions were observed in February, April, November 2011, each at around 10% (figure 2). In 2012 the peaks were observed during March to April at around 10%, August at 11% and December at 9%. All of the peaks, aside from December 2012, consisted of articles assigned to the five main subject areas. December 2012 saw a rise in articles relating to 'Trends & Events' but there was no particular incident contributing to this. There were peaks during Bowel Cancer Awareness Month in April 2011 and 2012 covering topics common to the rest of the year.

When coverage was examined by newspaper type, tabloid newspapers published the highest mean number of 266 articles related to breast cancer, closely followed by tabloid newspapers with 265 articles and then broadsheet newspapers with 175 articles (table 3). After breast cancer, broadsheet and tabloid newspapers most commonly reported on lung cancer while middle-market newspapers reported on prostate cancer. The mean number of related articles was less than 130 for cancers other than breast cancer in any type of newspaper.

DISCUSSION

Summary of main findings

This study using the Nexis newspaper database found that UK national newspaper coverage of common cancers did not always reflect the burden of newly diagnosed cases. During 2011, breast cancer and bowel cancer were the most and least commonly covered cancers, but the coverage of lung and prostate cancer was not consistent with their burden. However, newspaper coverage in 2012 did reflect the ranking of newly diagnosed cases for all of the cancers studied. Breast cancer was consistently the most commonly covered cancer by each of the tabloid, middle-market and broadsheet newspaper groups, although only in the latter group did the ranking of coverage reflect the relative disease burden. As well as breast cancer being highly reported throughout the two-year study period

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there were notable peaks coinciding with Breast Cancer Awareness Month in each October. The high proportion of articles tagged under the most common subject areas of 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections' indicate that journalists and editors reported a variety of articles related to breast cancer. However, there was also high coverage of the case of a golf champion's wife who had died from breast cancer supporting the idea that newspapers are responsive to reporting breast cancer in the context of personalisation. Considering the similar number of people diagnosed with prostate cancer each year this cancer was underreported in comparison with breast cancer. There was no rise in articles during its official awareness month in March. Instead, all peaks in coverage were triggered by the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer.

Peaks in articles relating to lung cancer were generally concerned with personal stories, such as asbestos exposure or cases of celebrities who had died from the disease. Bowel cancer articles covered a range of subjects with peaks triggered by events tagged under the five most common subjects. There were also peaks during its cancer awareness month in April suggesting that journalists may have attempted to increase their coverage of bowel cancer during the campaign period.

Comparison to other studies

Studies carried out in China, the United States and the United Kingdom also found that newspaper coverage generally did not reflect population cancer burden when measured as incidence, mortality or prevalence.[17-19] That breast cancer dominates media coverage in newspapers as well as magazines, television news broadcasts and online news is also a consistent finding.[5, 17, 19-23] It has been suggested that this is likely to be due to the early establishment and effective marketing models used by breast cancer campaigners.[18, 24] Breast Cancer Awareness Month triggered heightened news coverage in this study and was also found in the United States.[25]

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Prostate cancer was one of the most frequent cancers mentioned in previous studies of newspaper, magazine and online news.[17, 20, 22] Some also found that its coverage was underreported, especially since the number of new diagnoses is similar to breast cancer.[5, 22] One reason for this may be that Prostate Cancer Awareness Month was introduced later than that for breast cancer. Another reason may be that the difficulty of screening for and treating its early symptoms means that there is no national UK screening programme for newspapers to promote, unlike the widespread discussion in some other countries such as the United States.[26]

Lung cancer was the second most commonly reported cancer in this study, consistent with other analyses of newspaper coverage.[5, 17] Other studies have also found this cancer was heavily underreported considering its high incidence and mortality rate.[17-19] The exception was one of Japanese newspapers that found lung cancer coverage to be the highest, consistent with mortality rates in Japan.[27] This may be because Japanese newspapers covered a high proportion of death-related articles - a common subject for lung cancer articles in this and in one US study.[18]

Bowel cancer was the least covered cancers in this study. This study and others have found that media coverage of bowel cancer was generally underreported relative to its burden[17, 19, 21] The peaks in newspaper coverage identified here in April, coinciding with Bowel Cancer Awareness Month and do however suggest an increasing success for this initiative. Similarly a Swiss study found that a bowel cancer campaign led to increased newspaper coverage confined to the campaign period.[28] The other peaks identified in the current study consisted of articles relating to the common subject areas and were not related to any particular event. Another study carried out on UK national newspapers found that almost half of newspaper articles mentioning bowel cancer were not actually relevant to the cancer.[29]

The influence of celebrity cases on UK national newspaper coverage was observed in varying degrees across all of the cancer types studied although some were of a relatively low-profile cases compared with the well-studied example of television celebrity Jade Goody whose experience with cervical cancer increased screening among British women.[30, 31] In the United States cases of bowel cancer

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associated with high-profile figures has also led to a corresponding increase in the use of early detection tests.[32, 33]

Strengths and potential limitations

This study was unique in examining the influence of cancer awareness months on coverage in UK national newspapers. It was able to make use of existing classification tools to identify the focus of the articles retrieved, but this depends on the subjects already assigned rather than a new content analysis of the articles. The national newspapers included in this study although comprehensive and representative, were part of a predefined category provided by Nexis and thus may be incomplete. However, the resource is well-established and will allow for more consistent replication of the methods used in the future. This study only examined newspapers, and while they remain a popular and widespread source of information, other media such as magazines, television broadcasts, radio, online news and social media are also important. In addition, the exploratory nature of this study meant that there was no examination of the content quality of the articles, but it can be argued that quantity will have a more powerful effect on publics' perception of a disease.

Implications for policy and practice

Awareness months can only ever be one aspect of health promotion efforts to influence awareness of particular diseases, knowledge of when to act on particular symptoms and individual behaviour change in response to them. Although there is some evidence that raising awareness of certain cancers leads to earlier diagnosis or improved outcomes, this area of research still needs to be developed before effective interventions can be recommended.[34] Under-representation of cancer types relative to their burden may, however, still impact on public knowledge and perceptions of risk, and on policies such as funding support.[35, 36] While using personal experiences is an engaging method for profit-making media it is important that medical journalists ensure accurate and relevant messages are presented in their articles whether in the context of a celebrity case or a specific awareness piece.

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The marketing models employed by activists during Breast Cancer Awareness Month have been successful at influencing the news coverage in US newspapers and subsequently affected health behaviours such as internet search activity.[37] The increased UK newspaper coverage seen in this study for breast cancer and bowel cancer during their awareness months but not for prostate and lung cancer suggests that campaigners should examine the methods of breast cancer activists since evidence suggests that the media are responsive to such campaigning.[5] Media coverage was also confined to campaign periods and so a further challenge is to sustain relevant, accurate and appropriate messages to the public. Medical professionals, health promoting public bodies and charities should collaborate more closely with medical journalists to ensure that relevant information is incorporated into articles, especially those reporting unpredictable news stories. Although the use of other media is increasing, newspapers may still be able to present the symptoms and treatment of some cancers in an appealing manner which can make health promotion using other media difficult. For example, in one study bowel cancer was more commonly covered by newspapers than magazines or television broadcasts compared to breast cancer.[18] In addition, newspapers serve as a relatively low-cost route to reach a large, national audience. Different newspaper types attract audiences with similar characteristics and understanding this could help target and tailor messages to the at-risk groups. Health promoting public bodies may also consider the use of extensive social media which may also have a positive effect on health behaviours.[13]

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Table 1: Subjects used by the LexisNexis SmartIndexing Technology™

Main subject area	Examples of subjects
Company Activities & Management	Board & Management Changes, Sales & Selling
Crime, Law Enforcement & Corrections	Crime Prevention, Human Rights Violations
Economy & Economic Indicators	Economic Policy, Output & Demand
Education & Training	Educational Funding, Teaching & Teachers
Environment & Natural Resources	Natural Resources, Toxic & Hazardous Substances
Government & Public Administration	Elections & Politics, International Organisations & Bodies
Humanities & Social Sciences	Literature, Visual & Performing Arts
International Relations & National Security	Human Rights, International Organisations & Bodies
Labour & Employment	Employment Trends, Workplace Health & Safety
Law & Legal System	Administrative Law, Legal Ethics
Medicine & Health	Diseases & Disorders, Health Care Information
Population & Demographics	Demographic Groups, Population Characteristics
Reports, Reviews & Sections	Listings & Notice, Statistics
Safety, Accidents & Disasters	Accidents & Disasters, Safety
Science & Technology	Computer Science, Medicine Science
Society, Social Welfare & Lifestyle	Families & Children, Philanthropy
Sports & Recreation	Athletes, Sports & Recreation Events
Trade & Development	Economic Development, Trade Regulation & Policy
Trends & Events	Current Events, Public Hearings

Table 2: Number of newly diagnosed cancer cases in the UK in 2010[14] and number of articles mentioning breast, lung, prostate and bowel cancers in UK national newspapers 2011-2012

Cancer type	Number of new cases in 2011			Number of articles (rank)	
	Persons	Males	Females	2011	2012
Breast	49961	397	49564	2102 (1)	2135 (1)
Lung	42026	23175	18851	884 (3)	862 (2)
Prostate	40975	40975	-	992 (2)	765 (3)
Bowel	40695	22834	17861	701 (4)	737 (4)

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Table 3: Mean number of articles mentioning breast, lung, prostate and bowel cancers by newspaper type, 2011-2012

Newspaper type (number analysed)	Cancer type			
	Breast	Lung	Prostate	Bowel
Broadsheet (9)	175	88	83	55
Middle-market (4)	265	97	127	105
Tabloid (6)	266	94	83	87

Figure 1: Proportion of breast cancer and prostate cancer articles published per month (in 2011 and 2012) in UK National newspapers

Figure 2: Proportion of lung cancer and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers

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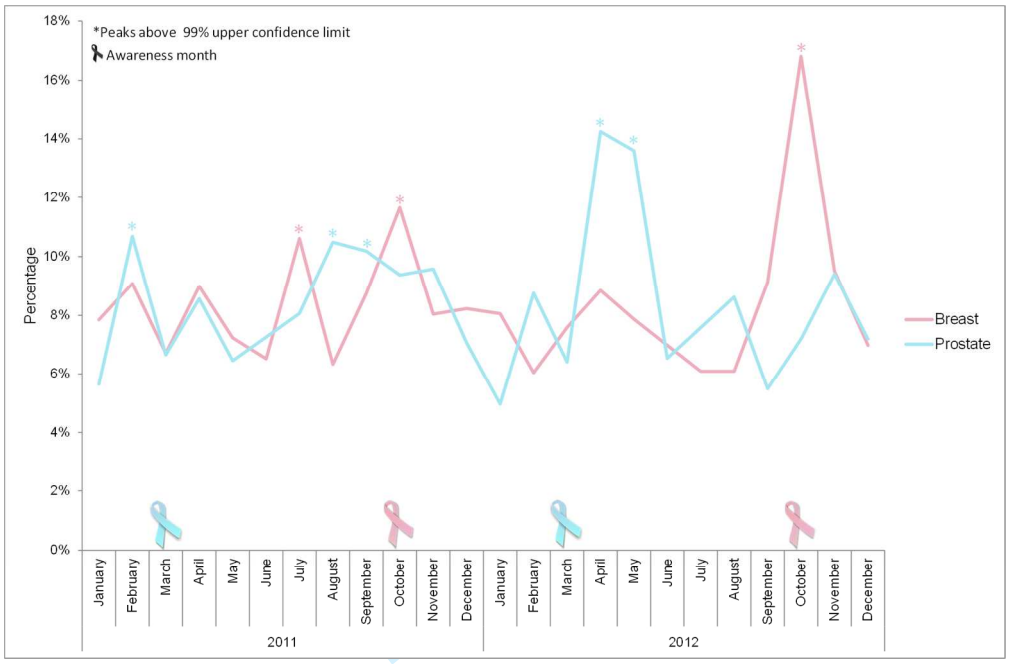

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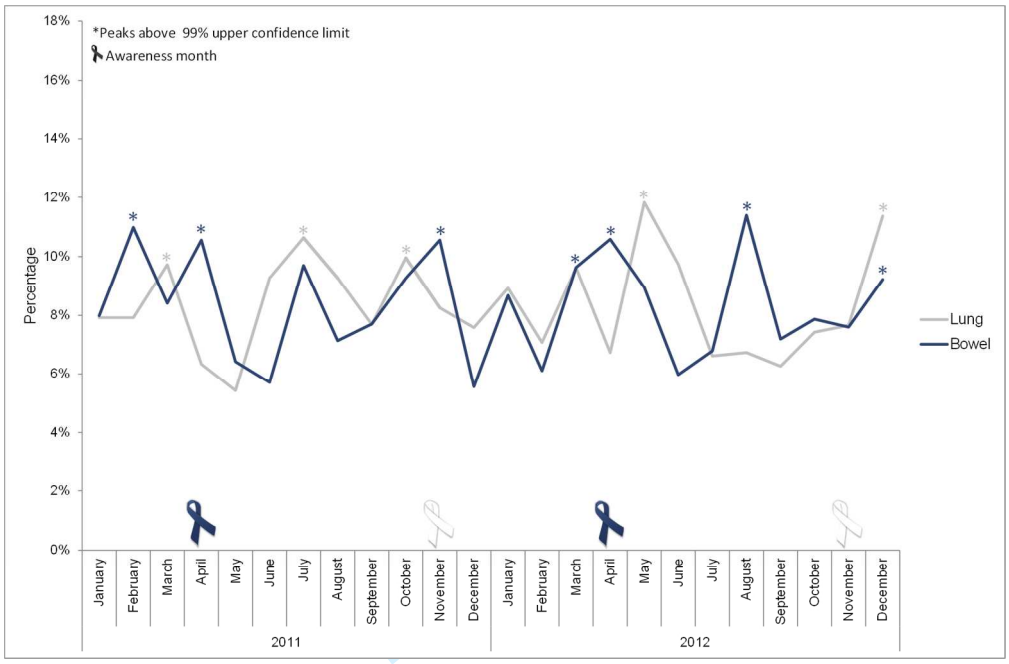

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Do awareness months affect the coverage of common cancer types in UK national newspapers?

Thematic analysis

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ABSTRACT

Objective: To determine whether recent newspaper coverage of the four most common cancer types relates to their relative burden and national awareness months, and to identify the subject focus during high coverage periods.

Design: Thematic analysis using the Nexis newspaper article database.

Setting: United Kingdom 2011-2012.

Outcome measures: Annual number and ranking, monthly proportions and subject of articles on breast, lung, bowel and prostate cancers.

Results: 9178 articles were identified during 2011 and 2012 featuring breast (4237), prostate (1757), lung (1746) and bowel (1438) cancer. Peaks in monthly proportions above the 99% upper confidence limit were identified for each. Breast cancer had the highest coverage of 12% and 17% during its awareness month. Smaller peaks (11%) were identified during Bowel Cancer Awareness month. Prostate cancer received high coverage in relation to the case of the man convicted of the Lockerbie bombing who had been diagnosed with the cancer, and lung cancer in relation to the deaths of celebrities. Breast cancer was covered most often overall and by newspaper category while the lower coverage of other cancer types did not consistently mirror the relative number of new cases each year. The peaks by newspaper category were similar to the overall coverage with few exceptions.

Conclusions: UK newspaper coverage of common cancer types other than breast appears under-represented relative to their population burden. Coverage of breast cancer and bowel cancer appear influenced by their awareness months, while prostate and lung cancer are influenced by other media stories. Health promoting public bodies and campaigners could learn from the success of Breast Cancer Awareness Month and work more closely with journalists to ensure relevant messages reach wider audiences.

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ARTICLE SUMMARY

Key messages

- Breast cancer received high coverage throughout the study period, consistent with the high number of cases diagnosed, while lung, prostate and bowel cancers were under-represented relative to their population burden. This suggests that cancer advocates and health promoting bodies need to find ways of increasing the media exposure of these cancer types.
- UK newspaper coverage of breast and bowel cancer in 2011 and 2012 was high during their awareness months, suggesting that cancer advocates had been more successful in reaching journalists with stories about these cancer types than for lung and prostate cancer.
- Many newspaper articles used personalisation and celebrity stories about cancer to attract their audiences. These could represent an opportunity for journalists and health-promoting bodies to work together on including accurate and relevant population health messages.

Strengths and limitations

This study made novel use of an established comprehensive database and classification tool to identify the subject focus of newspaper articles. While this method allows a large number of articles to be assessed and to replicate and monitor the findings over time, content analysis would reveal the more detailed messages and themes within them. National newspapers are a widespread form of media but others such as magazines, television, radio, online news and social media are not included and should be considered.

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INTRODUCTION

Breast, lung, prostate and bowel cancer were the four most commonly diagnosed cancer types in the UK in 2010, which collectively accounted for over 50% of cancer diagnoses.[1] These cancer types each have associated awareness months which are increasingly used by charities and other non-profit and public organisations to raise the profile of particular diseases, spread information about early symptoms or detection and raise funds for research or treatment. A leading example is Breast Cancer Awareness Month which was introduced to the United Kingdom by the charity Breast Cancer Care in 1993.[2] Bowel Cancer Awareness Month was established later in 2000,[3] followed by Lung Cancer Awareness Month in 2002[4] and Prostate Cancer Awareness Month in 2009.[5]

Given that most people do not meet medical professionals regularly the media is a valuable means of raising public awareness and knowledge about cancer and disseminating health information in general. Studies carried out in China, the United States and the United Kingdom found that newspaper coverage generally did not mirror population cancer burden when measured as incidence, mortality or prevalence.[6-8] This is not unexpected as the goals of mass media are generally information provision and entertainment. ~~However,~~ Journalists often need to deliver a story with 'human interest' which can mean cancer news items may be biased towards personal accounts and risk distorting perceptions of the disease burden in populations.[9] For example, stories about young female celebrities with cancer may create a false perception that the disease affects younger women more often than older women, such as the 'Kylie effect' resulting from the diagnoses of the Australian singer Kylie Minogue aged 36.[10] The attention the UK media gave to the diagnosis of the celebrity Jade Goody with cervical cancer and her wish to raise awareness of screening led to a national debate about its effectiveness in young women,[11] and an increase in screening coverage and information seeking.[12, 13] Aside from celebrity stories, media campaigns have been shown to influence cancer-related behaviours such as increasing cancer screening uptake in the US and Australia,[14-16] and reducing the use of sunbeds in Denmark.[17]

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National newspapers are one widespread medium for cancer awareness but no study has yet evaluated whether awareness months affect cancer coverage in the United Kingdom. This study aimed to quantify recent national newspaper coverage of the four most commonly diagnosed cancer types, in particular to determine whether coverage was related to their relative population burden and whether national awareness months influenced the number of articles published in the United Kingdom. It also aimed to identify the subject focus of the articles published during awareness months or other high coverage periods.

METHODS

Data were extracted from the well-established, searchable, news article database Nexis® UK.[18] The newspaper articles were identified by the keywords 'breast cancer', 'lung cancer', 'prostate cancer', 'bowel cancer', 'colorectal cancer', 'colon cancer' and 'rectal cancer'. The search was limited to newspaper articles published in 2011 and 2012 as the prostate cancer awareness month had only started relatively recently, and the study intended to give a current picture of cancer coverage, forming the basis for future research. Articles were identified as those under the source category 'UK National Newspapers' and duplicates were eliminated. The national newspapers that the database included under this category were grouped into three categories, tabloid (Daily Star, Morning Star, The Mirror, The Sunday Mirror, The People and The Sun), middle-market (Daily Mail, The Mail on Sunday, The Express and The Sunday Express) and broadsheet (The Daily Telegraph, The Sunday Telegraph, The Guardian, The Observer, i, The Independent, Independent on Sunday, The Times and The Sunday Times).

For each cancer type, the number of articles published in a month was divided by the number of articles published that year. The mean number of articles was also calculated separately for the different newspaper categories, accounting for the difference in number of newspapers in each of the categories.

Peaks in coverage were identified as those above the 99% upper confidence limit for the mean by cancer type and publication year. These were then matched to the cancer awareness months – March

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for prostate, April for bowel, October for breast and November for lung cancer. Population burden was measured as the number of newly diagnosed cases in 2010 – the year for which the most recent statistics were available.

The subject focus of each article was assigned by Nexis using the LexisNexis SmartIndexing Technology™. This is a rule-based classification system developed by researchers and information professionals that is able to label articles with controlled vocabularies for the companies, industries, subjects, people and locations discussed within the documents. The system is regularly tested by Nexis and updated to ensure accuracy. In combination with source indexing, it is an easy and quick system to search for relevant articles by various sources or time periods.[19] At the beginning of 2013 there were 19 main subject areas which were further divided into 191 more specific subjects and articles may have been tagged with more than one subject. The main subjects contributing to peaks in coverage above the 99% upper confidence limit were identified to give a general overview and articles were read to identify specific events which may have led to the rise. This analysis was repeated for tabloid, middle-market and broadsheet newspaper categories separately.

RESULTS

A total of 9178 articles relating to the four most commonly diagnosed cancer types in the United Kingdom were identified for the study period with a similar number published in each year. In both years breast cancer and bowel cancer were consistently the most and least covered cancer types and this mirrored their ranking in terms of number of newly diagnosed cases (table 1). Generally the five main subject areas for all articles about each of the cancer types were ‘Medicine & Health’, ‘Population & Demographics’, ‘Science & Technology’, ‘Society, Social Welfare & Lifestyle’ and ‘Reports, Reviews & Sections’.

Overall coverage

Coverage of breast cancer was the most frequent in both years with a total of 4237 articles. Peaks in its coverage were in July and October 2011, and October 2012 (figure 1A). Coverage in July 2011, which made up 11% of the published articles in that year, had a high proportion of articles tagged

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under the subject area 'Sports & Recreation'. These articles referred to the case of a golf champion's wife who had died from breast cancer. October 2011 and 2012 had the highest proportions of coverage, 12% in 2011 and 17% in 2012, which coincided with Breast Cancer Awareness Month. The subject focus of these articles was still concentrated around the top five main subject areas.

Prostate cancer was the second most frequently mentioned cancer overall, being covered by 1757 articles. The proportions peaked in February, August, and September 2011 at around 10%, and April and May 2012 at 14% (figure 1C). These peaks all had a notable proportion of articles tagged under the subject area 'International Relations & National Security' and these were mainly associated with the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. None of these peaks coincided with Prostate Cancer Awareness Month which takes place in March.

Lung cancer followed closely with 1746 articles over the two years. Peaks in the proportions of articles were identified in March, July and October 2011 at around 10% (figure 1B). In 2012 peaks were observed in May and December at over 11%. March 2011 saw a rise in articles relating to 'Government & Public Administration', which were generally concerned with articles relating to compensation for victims of asbestos exposure. July 2011 saw a rise in articles that were confined to the top five main subject areas. There was also a rise in articles tagged under the subject area 'Humanities & Social Sciences' for the months October 2011, May and December 2012; these were mainly covering stories about deaths from lung cancer, particularly of celebrities. There were no peaks in coverage observed during the cancer awareness month in November.

Bowel cancer was covered by 1438 newspaper articles during the study period. The peaks in proportions were observed in February, April, November 2011, each at around 10% (figure 1D). In 2012 the peaks were observed during March to April at around 10% and August at 11%. All of the peaks consisted of articles assigned to the five main subject areas. There were peaks during Bowel Cancer Awareness Month in April 2011 and 2012 covering topics common to the rest of the year.

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Coverage by newspaper category

When coverage was examined by newspaper category, breast cancer had the highest mean number of articles published over the two-year period, 266 by tabloid, 265 by middle-market and 175 by broadsheet (table 2). The mean number of related articles was less than 130 for cancer types other than breast cancer in any category of newspaper.

A majority of the peaks observed by newspaper category were the same as the overall picture, or had no specific contributing event (figure 2). The exceptions were for lung cancer peaks in broadsheet newspapers during June 2011 and March 2012 (figure 2B). The peak in June 2011 was related to the peace campaigner Brian Haw who died from lung cancer and was also observed in middle-market newspapers. March 2012 saw a rise in articles covering the success of a legal battle for compensation payments to sufferers of asbestos-related cancers. For prostate cancer, the only unique peak was observed for August 2012 in tabloid newspapers and was related to articles about the risks of eating fried meat and prostate cancer (figure 2C). Bowel cancer had a peak in middle-market newspapers for July 2011 which was related to the risk of death from side-effects of capecitabine, a drug used to treat this cancer (figure 2D).

DISCUSSION

Summary of main findings

This study using the Nexis newspaper database found that UK national newspaper coverage of common cancer types did not always mirror the burden of newly diagnosed cases. During 2011, breast cancer and bowel cancer were the most and least commonly covered cancer types of those studied, but the coverage of lung and prostate cancer was not consistent with their burden. However, newspaper coverage in 2012 did mirror the ranking of newly diagnosed cases for all of the cancer types studied. Breast cancer was consistently the most commonly covered cancer by each of the tabloid, middle-market and broadsheet newspaper categories; although only in the latter group did the ranking of coverage mirror the relative disease burden. As well as breast cancer being highly reported throughout the two-year study period there were notable peaks coinciding with Breast Cancer

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Awareness Month in each October, both overall and by each newspaper category. The high proportion of breast cancer articles tagged under the most common subject areas of 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections' during almost every month indicate that journalists and editors were generally prone to reporting articles under a limited number of subjects. However, there was high coverage of the case of a golf champion's wife who had died from breast cancer supporting the idea that newspapers are responsive to reporting breast cancer in the context of personalisation. Considering the similar number of people diagnosed with prostate cancer each year this cancer was under-reported in comparison with breast cancer. There was no rise in articles during its official awareness month in March. Instead, peaks in coverage were triggered by the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. Tabloid newspapers also had a peak in coverage of prostate cancer related to an increased risk caused by eating fried meat. In this case tabloid newspapers were more likely to report on scientific research with a causation message compared with broadsheet and middle-market newspapers.

Peaks in articles relating to lung cancer were generally concerned with personal stories, such as asbestos exposure or cases of celebrities who had died from the disease. Bowel cancer articles covered a range of subjects with peaks triggered by events tagged under the five most common subjects. The exception was a peak in middle-market newspapers' coverage, which had a small proportion of articles related to side effects of a bowel cancer drug. There were also peaks during its cancer awareness month in April in both tabloid and broadsheet newspapers suggesting that journalists for these newspapers may have attempted to increase their coverage of bowel cancer during the campaign period.

Comparison to other studies

That breast cancer dominates media coverage in newspapers as well as magazines, television news broadcasts and online news is a consistent finding with previous research.[6, 8, 9, 20-23] It has been

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suggested that this is likely to be due to the early establishment and effective marketing models used by breast cancer campaigners.[7, 24] Breast Cancer Awareness Month triggered heightened news coverage in this study and in the United States.[25]

Prostate cancer was one of the most frequent cancer types mentioned in previous studies of newspapers, magazines and online news.[6, 20, 22] Some also found that its coverage was under-reported, especially since the number of new diagnoses is similar to breast cancer.[9, 22] One reason for this may be that Prostate Cancer Awareness Month was introduced later than that for breast cancer. Another reason may be that the difficulty of screening for and identifying its early symptoms means that there is no national UK screening programme for newspapers to promote, unlike the widespread discussion in some other countries such as the United States.[26]

Lung cancer was the second most commonly reported cancer in this study, consistent with other analyses of newspaper coverage.[6, 9] Other studies have also found this cancer was heavily under-reported considering its high incidence and mortality rate.[6-8] The exception was one of Japanese newspapers that found lung cancer coverage to be the highest, consistent with mortality rates in Japan.[27] This may be because Japanese newspapers covered a high proportion of death-related articles - a common subject for lung cancer articles in this and in one US study.[7]

Bowel cancer was the least covered cancer type in this study. This study and others have found that media coverage of bowel cancer was generally under-reported relative to its burden[6, 8, 21] The peaks in newspaper coverage identified here in April, coinciding with Bowel Cancer Awareness Month do however suggest an increasing success for this initiative. Similarly a Swiss study found that a bowel cancer campaign led to increased newspaper coverage confined to the campaign period.[28] The other peaks identified in the current study consisted of articles relating to the common subject areas and were not related to any particular event. Another study carried out on UK national newspapers found that almost half of newspaper articles mentioning bowel cancer were not actually relevant to the cancer.[29]

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The influence of celebrity cases on UK national newspaper coverage was observed in varying degrees across all of the cancer types studied although some were of relatively low-profile cases compared with the well-studied example of television celebrity Jade Goody whose experience with cervical cancer increased screening among British women.[30, 31] In the United States cases of bowel cancer associated with high-profile figures has also led to a corresponding increase in the use of early detection tests.[32, 33]

Strengths and potential limitations

This study was unique in examining the influence of cancer awareness months on coverage in UK national newspapers. It was able to make use of existing classification tools to identify the focus of the articles retrieved, but this depends on the subjects already assigned rather than a new content analysis of the articles. The national newspapers included in this study although comprehensive and representative, were part of a predefined category provided by Nexis and thus may be incomplete. However, the resource is well-established and will allow for more consistent replication of the methods used in the future. This study only examined newspapers, and while they remain a popular and widespread source of information, other media such as magazines, television broadcasts, radio, online news and social media are also important. In addition, the exploratory nature of this study meant that there was no examination of the content quality of the articles, but it can be argued that quantity will have a more powerful effect on public perceptions of disease.

Implications for policy and practice

Awareness months can only ever be one aspect of health promotion efforts to influence awareness of particular diseases, knowledge of when to act on particular symptoms, and individual behaviour change in response to them. Although there is some evidence that raising awareness of certain cancer types leads to earlier diagnosis or improved outcomes, this area of research still needs to be developed before effective interventions can be recommended.[34] Under-representation of cancer types relative to their burden may, however, still impact on public knowledge and perceptions of risk, and on policies such as funding support.[35, 36] While using personal experiences is an engaging method for

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profit-making media it is important that medical journalists ensure that accurate and relevant messages are presented in their articles whether in the context of a celebrity case or a specific awareness piece.

The marketing models employed by activists during Breast Cancer Awareness Month have been successful at influencing the news coverage in US newspapers and subsequently affected health behaviours such as internet search activity.[37] The increased UK newspaper coverage seen in this study for breast cancer and bowel cancer during their awareness months but not for prostate and lung cancer suggests that campaigners should examine the methods of breast and bowel cancer activists since evidence suggests that the media are responsive to such campaigning.[9] Peaks of media coverage were also confined to campaign periods and so a further challenge is to sustain relevant, accurate and appropriate messages to the public. Medical professionals, health promoting public bodies and charities should collaborate more closely with medical journalists to ensure that relevant information is incorporated into articles, especially those reporting unpredictable news stories. Although the use of other media is increasing, newspapers may still be able to present the symptoms and treatment of some cancer types in an appealing manner which can make health promotion using other media difficult. For example, in one study bowel cancer was more commonly covered by newspapers than magazines or television broadcasts compared with breast cancer.[7] In addition, newspapers serve as a relatively low-cost route to reach a large, national audience. This study was unique in examining coverage by different types of newspapers and found some minor distinction between the coverage of common cancer types. Different newspaper categories attract audiences with similar characteristics and understanding this could help target and tailor messages to the at-risk groups. Health promoting public bodies could also consider the use of extensive social media which may also have a positive effect on health behaviours.[17]

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Table 1: Number of newly diagnosed cancer cases in the UK in 2010[1] and number of articles mentioning breast, lung, prostate and bowel cancers in UK national newspapers, 2011-2012

Cancer type	Number of new cases in 2011			Number of articles (rank)	
	Persons	Males	Females	2011	2012
Breast	49961	397	49564	2102 (1)	2135 (1)
Lung	42026	23175	18851	884 (3)	862 (2)
Prostate	40975	40975	-	992 (2)	765 (3)
Bowel	40695	22834	17861	701 (4)	737 (4)

Table 2: Mean number of articles mentioning breast, lung, prostate and bowel cancers by newspaper category, 2011-2012

Newspaper category (number of newspapers)	Cancer type			
	Breast	Lung	Prostate	Bowel
Broadsheet (9)	175	88	83	55
Middle-market (4)	265	97	127	105
Tabloid (6)	266	94	83	87

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Data sharing statement: The data used for this study was accessed by authorised, non-transferable subscription to the Nexis® database https://www.lexisnexis.com/uk/nexis/. Due to licensing agreements, interested parties will need to subscribe to this online service to retrieve data used in this study for similar research.

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Figure Legends:

Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category

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Do awareness months affect the coverage of common cancer types in UK national newspapers? Thematic analysis

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ABSTRACT

Objective: To determine whether recent newspaper coverage of the four most common cancer types relates to their relative burden and national awareness months, and to identify the subject focus during high coverage periods.

Design: ~~Longitudinal study~~ Thematic analysis using the Nexis newspaper article database.

Setting: United Kingdom 2011-2012.

Outcome measures: Annual number and ranking, monthly proportions and subject of articles on breast, lung, bowel and prostate cancers.

Results: 9178 articles were identified during 2011 and 2012 featuring breast (4237), prostate (1757), lung (1746) and bowel (1438) cancer. Peaks in monthly proportions above the 99% upper confidence limit were identified for each. Breast cancer had the highest coverage of 12% and 17% during its awareness month. Smaller peaks (11%) were identified during Bowel Cancer Awareness month. Prostate cancer received high coverage in relation to the case of the man convicted of the Lockerbie bombing who had been diagnosed with the cancer, and lung cancer in relation to the deaths of celebrities. Breast cancer was covered most often overall and by newspaper category while the lower coverage of other cancer types did not consistently mirror the relative number of new cases each year. The peaks by newspaper category were similar to the overall coverage with few exceptions.

Conclusions: UK newspaper coverage of common cancer types other than breast appears under-represented relative to their population burden. Coverage of breast cancer and bowel cancer appear influenced by their awareness months, while prostate and lung cancer are influenced by other media stories. Health promoting public bodies and campaigners could learn from the success of Breast Cancer Awareness Month and work more closely with journalists to ensure relevant messages reach wider audiences.

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ARTICLE SUMMARY

Key messages

- Breast cancer received high coverage throughout the study period, consistent with the high number of cases diagnosed, while lung, prostate and bowel cancers were under-represented relative to their population burden. This suggests that cancer advocates and health promoting bodies need to find ways of increasing the media exposure of these cancer types.
- UK newspaper coverage of breast and bowel cancer in 2011 and 2012 was high during their awareness months, suggesting that cancer advocates had been more successful in reaching journalists with stories about these cancer types than for lung and prostate cancer.
- Many newspaper articles used personalisation and celebrity stories about cancer to attract their audiences. These could represent an opportunity for journalists and health-promoting bodies to work together on including accurate and relevant population health messages.
- ~~Media and awareness campaigns may prove to be an effective method of increasing knowledge and health behaviours around prevention, but more research on their effectiveness at promoting early diagnosis is required.~~

Strengths and limitations

This study made novel use of an established comprehensive database and classification tool to identify the subject focus of newspaper articles. While this method allows a large number of articles to be assessed and to replicate and monitor the findings over time, content analysis would reveal the more detailed messages and themes within them. National newspapers are a widespread form of media but others such as magazines, television, radio, online news and social media are not included and should be considered.

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INTRODUCTION

Breast, lung, prostate and bowel cancer were the four most commonly diagnosed cancer types in the UK in 2010, which collectively accounted for over 50% of cancer diagnoses.[1] These cancer types each have associated awareness months which are increasingly used by charities and other non-profit and public organisations to raise the profile of particular diseases, spread information about early symptoms or detection and raise funds for research or treatment. A leading example is Breast Cancer Awareness Month which was introduced to the United Kingdom by the charity Breast Cancer Care in 1993.[2] Bowel Cancer Awareness Month was established later in 2000,[3] followed by Lung Cancer Awareness Month in 2002[4] and Prostate Cancer Awareness Month in 2009.[5]

Given that most people do not meet medical professionals regularly the media is a valuable means of raising public awareness and knowledge about cancer and disseminating health information in general. Studies carried out in China, the United States and the United Kingdom found that newspaper coverage generally did not mirror population cancer burden when measured as incidence, mortality or prevalence.[6-8] This is not unexpected as the goals of mass media are generally information provision and entertainment. ~~However,~~ Journalists often need to deliver a story with 'human interest' which can mean cancer news items may be biased towards personal accounts and risk distorting perceptions of the disease burden in populations.[9] For example, stories about young female celebrities with cancer may create a false perception that the disease affects younger women more often than older women, such as the 'Kylie effect' resulting from the diagnoses of the Australian singer Kylie Minogue aged 36.[10] The attention the UK media gave to the diagnosis of the celebrity Jade Goody with cervical cancer and her wish to raise awareness of screening led to a national debate about its effectiveness in young women,[11] and an increase in screening coverage and information seeking.[12, 13] Aside from celebrity stories, media campaigns have been shown to influence cancer-related behaviours such as increasing cancer screening uptake in the US and Australia,[14-16] and reducing the use of sunbeds in Denmark.[17]

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National newspapers are one widespread medium for cancer awareness but no study has yet evaluated whether awareness months affect cancer coverage in the United Kingdom. This study aimed to quantify recent national newspaper coverage of the four most commonly diagnosed cancer types, in particular to determine whether coverage was related to their relative population burden and whether national awareness months influenced the number of articles published in the United Kingdom. It also aimed to identify the subject focus of the articles published during awareness months or other high coverage periods.

METHODS

Data were extracted from the well-established, searchable, news article database Nexis® UK.[18] The newspaper articles were identified by the keywords 'breast cancer', 'lung cancer', 'prostate cancer', 'bowel cancer', 'colorectal cancer', 'colon cancer' and 'rectal cancer'. The search was limited to newspaper articles published in 2011 and 2012 as the prostate cancer awareness month had only started relatively recently, and the study intended to give a current picture of cancer coverage, forming the basis for future research. Articles were identified as those under the source category 'UK National Newspapers' and duplicates were eliminated. The national newspapers that the database included under this category were grouped into three categories, tabloid (Daily Star, Morning Star, The Mirror, The Sunday Mirror, The People and The Sun), middle-market (Daily Mail, The Mail on Sunday, The Express and The Sunday Express) and broadsheet (The Daily Telegraph, The Sunday Telegraph, The Guardian, The Observer, i, The Independent, Independent on Sunday, The Times and The Sunday Times).

For each cancer type, the number of articles published in a month was divided by the number of articles published that year. The mean number of articles was also calculated separately for the different newspaper categories, accounting for the difference in number of newspapers in each of the categories.

Peaks in coverage were identified as those above the 99% upper confidence limit for the mean by cancer type and publication year. These were then matched to the cancer awareness months – March

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for prostate, April for bowel, October for breast and November for lung cancer. Population burden was measured as the number of newly diagnosed cases in 2010 – the year for which the most recent statistics were available.

The subject focus of each article was assigned by Nexis using the LexisNexis SmartIndexing Technology™. This is a rule-based classification system developed by researchers and information professionals that is able to label articles with controlled vocabularies for the companies, industries, subjects, people and locations discussed within the documents. The system is regularly tested by Nexis and updated to ensure accuracy. In combination with source indexing, it is an easy and quick system to search for relevant articles by various sources or time periods.[19] At the beginning of 2013 there were 19 main subject areas which were further divided into 191 more specific subjects and articles may have been tagged with more than one subject. The main subjects contributing to peaks in coverage above the 99% upper confidence limit were identified to give a general overview and articles were read to identify specific events which may have led to the rise. This analysis was repeated for tabloid, middle-market and broadsheet newspaper categories separately.

RESULTS

A total of 9178 articles relating to the four most commonly diagnosed cancer types in the United Kingdom were identified for the study period with a similar number published in each year. In both years breast cancer and bowel cancer were consistently the most and least covered cancer types and this mirrored their ranking in terms of number of newly diagnosed cases (table 1). Generally the five main subject areas for all articles about each of the cancer types were 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections'.

Overall coverage

Coverage of breast cancer was the most frequent in both years with a total of 4237 articles. Peaks in its coverage were in July and October 2011, and October 2012 (figure 1A). Coverage in July 2011, which made up 11% of the published articles in that year, had a high proportion of articles tagged

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under the subject area 'Sports & Recreation'. These articles referred to the case of a golf champion's wife who had died from breast cancer. October 2011 and 2012 had the highest proportions of coverage, 12% in 2011 and 17% in 2012, which coincided with Breast Cancer Awareness Month. The subject focus of these articles was still concentrated around the top five main subject areas.

Prostate cancer was the second most frequently mentioned cancer overall, being covered by 1757 articles. The proportions peaked in February, August, and September 2011 at around 10%, and April and May 2012 at 14% (figure 1C). These peaks all had a notable proportion of articles tagged under the subject area 'International Relations & National Security' and these were mainly associated with the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. None of these peaks coincided with Prostate Cancer Awareness Month which takes place in March.

Lung cancer followed closely with 1746 articles over the two years. Peaks in the proportions of articles were identified in March, July and October 2011 at around 10% (figure 1B). In 2012 peaks were observed in May and December at over 11%. March 2011 saw a rise in articles relating to 'Government & Public Administration', which were generally concerned with articles relating to compensation for victims of asbestos exposure. July 2011 saw a rise in articles that were confined to the top five main subject areas. There was also a rise in articles tagged under the subject area 'Humanities & Social Sciences' for the months October 2011, May and December 2012; these were mainly covering stories about deaths from lung cancer, particularly of celebrities. There were no peaks in coverage observed during the cancer awareness month in November.

Bowel cancer was covered by 1438 newspaper articles during the study period. The peaks in proportions were observed in February, April, November 2011, each at around 10% (figure 1D). In 2012 the peaks were observed during March to April at around 10% and August at 11%. ~~and December at 9%. All of the peaks, aside from December 2012,~~ All of the peaks consisted of articles assigned to the five main subject areas. ~~December 2012 saw a rise in articles relating to 'Trends &~~

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~~Events' but there was no particular incident contributing to this.~~ There were peaks during Bowel Cancer Awareness Month in April 2011 and 2012 covering topics common to the rest of the year.

Coverage by newspaper category

When coverage was examined by newspaper category, breast cancer had the highest mean number of articles published over the two-year period, 266 by tabloid, 265 by middle-market and 175 by broadsheet (table 2). The mean number of related articles was less than 130 for cancer types other than breast cancer in any category of newspaper.

A majority of the peaks observed by newspaper category were the same as the overall picture, or had no specific contributing event (figure 2). The exceptions were for lung cancer peaks in broadsheet newspapers during June 2011 and March 2012 (figure 2B). The peak in June 2011 was related to the peace campaigner Brian Haw who died from lung cancer and was also observed in middle-market newspapers. March 2012 saw a rise in articles covering the success of a legal battle for compensation payments to sufferers of asbestos-related cancers. For prostate cancer, the only unique peak was observed for August 2012 in tabloid newspapers and was related to articles about the risks of eating fried meat and prostate cancer (figure 2C). Bowel cancer had a peak in middle-market newspapers for July 2011 which was related to the risk of death from side-effects of capecitabine, a drug used to treat this cancer (figure 2D).

DISCUSSION

Summary of main findings

This study using the Nexis newspaper database found that UK national newspaper coverage of common cancer types did not always mirror the burden of newly diagnosed cases. During 2011, breast cancer and bowel cancer were the most and least commonly covered cancer types of those studied, but the coverage of lung and prostate cancer was not consistent with their burden. However, newspaper coverage in 2012 did mirror the ranking of newly diagnosed cases for all of the cancer types studied. Breast cancer was consistently the most commonly covered cancer by each of the

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tabloid, middle-market and broadsheet newspaper categories; although only in the latter group did the ranking of coverage mirror the relative disease burden. As well as breast cancer being highly reported throughout the two-year study period there were notable peaks coinciding with Breast Cancer Awareness Month in each October, both overall and by each newspaper category. The high proportion of breast cancer articles tagged under the most common subject areas of 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections' during almost every month indicate that journalists and editors were generally prone to reporting articles under a limited number of subjects. However, there was high coverage of the case of a golf champion's wife who had died from breast cancer supporting the idea that newspapers are responsive to reporting breast cancer in the context of personalisation. Considering the similar number of people diagnosed with prostate cancer each year this cancer was under-reported in comparison with breast cancer. There was no rise in articles during its official awareness month in March. Instead, peaks in coverage were triggered by the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. Tabloid newspapers also had a peak in coverage of prostate cancer related to an increased risk caused by eating fried meat. In this case tabloid newspapers were more likely to report on scientific research with a causation message compared with broadsheet and middle-market newspapers.

Peaks in articles relating to lung cancer were generally concerned with personal stories, such as asbestos exposure or cases of celebrities who had died from the disease. Bowel cancer articles covered a range of subjects with peaks triggered by events tagged under the five most common subjects. The exception was a peak in middle-market newspapers' coverage, which had a small proportion of articles related to side effects of a bowel cancer drug. There were also peaks during its cancer awareness month in April in both tabloid and broadsheet newspapers suggesting that journalists for these newspapers may have attempted to increase their coverage of bowel cancer during the campaign period.

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Comparison to other studies

That breast cancer dominates media coverage in newspapers as well as magazines, television news broadcasts and online news is a consistent finding with previous research.[6, 8, 9, 20-23] It has been suggested that this is likely to be due to the early establishment and effective marketing models used by breast cancer campaigners.[7, 24] Breast Cancer Awareness Month triggered heightened news coverage in this study and in the United States.[25]

Prostate cancer was one of the most frequent cancer types mentioned in previous studies of newspapers, magazines and online news.[6, 20, 22] Some also found that its coverage was under-reported, especially since the number of new diagnoses is similar to breast cancer.[9, 22] One reason for this may be that Prostate Cancer Awareness Month was introduced later than that for breast cancer. Another reason may be that the difficulty of screening for and identifying its early symptoms means that there is no national UK screening programme for newspapers to promote, unlike the widespread discussion in some other countries such as the United States.[26]

Lung cancer was the second most commonly reported cancer in this study, consistent with other analyses of newspaper coverage.[6, 9] Other studies have also found this cancer was heavily under-reported considering its high incidence and mortality rate.[6-8] The exception was one of Japanese newspapers that found lung cancer coverage to be the highest, consistent with mortality rates in Japan.[27] This may be because Japanese newspapers covered a high proportion of death-related articles - a common subject for lung cancer articles in this and in one US study.[7]

Bowel cancer was the least covered cancer type in this study. This study and others have found that media coverage of bowel cancer was generally under-reported relative to its burden[6, 8, 21] The peaks in newspaper coverage identified here in April, coinciding with Bowel Cancer Awareness Month do however suggest an increasing success for this initiative. Similarly a Swiss study found that a bowel cancer campaign led to increased newspaper coverage confined to the campaign period.[28] The other peaks identified in the current study consisted of articles relating to the common subject areas and were not related to any particular event. Another study carried out on UK

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national newspapers found that almost half of newspaper articles mentioning bowel cancer were not actually relevant to the cancer.[29]

The influence of celebrity cases on UK national newspaper coverage was observed in varying degrees across all of the cancer types studied although some were of relatively low-profile cases compared with the well-studied example of television celebrity Jade Goody whose experience with cervical cancer increased screening among British women.[30, 31] In the United States cases of bowel cancer associated with high-profile figures has also led to a corresponding increase in the use of early detection tests.[32, 33]

Strengths and potential limitations

This study was unique in examining the influence of cancer awareness months on coverage in UK national newspapers. It was able to make use of existing classification tools to identify the focus of the articles retrieved, but this depends on the subjects already assigned rather than a new content analysis of the articles. The national newspapers included in this study although comprehensive and representative, were part of a predefined category provided by Nexis and thus may be incomplete. However, the resource is well-established and will allow for more consistent replication of the methods used in the future. This study only examined newspapers, and while they remain a popular and widespread source of information, other media such as magazines, television broadcasts, radio, online news and social media are also important. In addition, the exploratory nature of this study meant that there was no examination of the content quality of the articles, but it can be argued that quantity will have a more powerful effect on public perceptions of disease.

Implications for policy and practice

Awareness months can only ever be one aspect of health promotion efforts to influence awareness of particular diseases, knowledge of when to act on particular symptoms, and individual behaviour change in response to them. Although there is some evidence that raising awareness of certain cancer types leads to earlier diagnosis or improved outcomes, this area of research still needs to be developed before effective interventions can be recommended.[34] Under-representation of cancer types relative

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to their burden may, however, still impact on public knowledge and perceptions of risk, and on policies such as funding support.[35, 36] While using personal experiences is an engaging method for profit-making media it is important that medical journalists ensure that accurate and relevant messages are presented in their articles whether in the context of a celebrity case or a specific awareness piece.

The marketing models employed by activists during Breast Cancer Awareness Month have been successful at influencing the news coverage in US newspapers and subsequently affected health behaviours such as internet search activity.[37] The increased UK newspaper coverage seen in this study for breast cancer and bowel cancer during their awareness months but not for prostate and lung cancer suggests that campaigners should examine the methods of breast and bowel cancer activists since evidence suggests that the media are responsive to such campaigning.[9] Peaks of media coverage were also confined to campaign periods and so a further challenge is to sustain relevant, accurate and appropriate messages to the public. Medical professionals, health promoting public bodies and charities should collaborate more closely with medical journalists to ensure that relevant information is incorporated into articles, especially those reporting unpredictable news stories. Although the use of other media is increasing, newspapers may still be able to present the symptoms and treatment of some cancer types in an appealing manner which can make health promotion using other media difficult. For example, in one study bowel cancer was more commonly covered by newspapers than magazines or television broadcasts compared with breast cancer.[7] In addition, newspapers serve as a relatively low-cost route to reach a large, national audience. This study was unique in examining coverage by different types of newspapers and found some minor distinction between the coverage of common cancer types. Different newspaper categories attract audiences with similar characteristics and understanding this could help target and tailor messages to the at-risk groups. Health promoting public bodies could also consider the use of extensive social media which may also have a positive effect on health behaviours.[17]

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Table 1: Number of newly diagnosed cancer cases in the UK in 2010[1] and number of articles mentioning breast, lung, prostate and bowel cancers in UK national newspapers, 2011-2012

Cancer type	Number of new cases in 2011			Number of articles (rank)	
	Persons	Males	Females	2011	2012
Breast	49961	397	49564	2102 (1)	2135 (1)
Lung	42026	23175	18851	884 (3)	862 (2)
Prostate	40975	40975	-	992 (2)	765 (3)
Bowel	40695	22834	17861	701 (4)	737 (4)

Table 2: Mean number of articles mentioning breast, lung, prostate and bowel cancers by newspaper category, 2011-2012

Newspaper category (number of newspapers)	Cancer type			
	Breast	Lung	Prostate	Bowel
Broadsheet (9)	175	88	83	55
Middle-market (4)	265	97	127	105
Tabloid (6)	266	94	83	87

Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category

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Data sharing statement: The data used for this study was accessed by authorised, non-transferable subscription to the Nexis® database https://www.lexisnexis.com/uk/nexis/. Due to licensing agreements, interested parties will need to subscribe to this online service to retrieve data used in this study for similar research.

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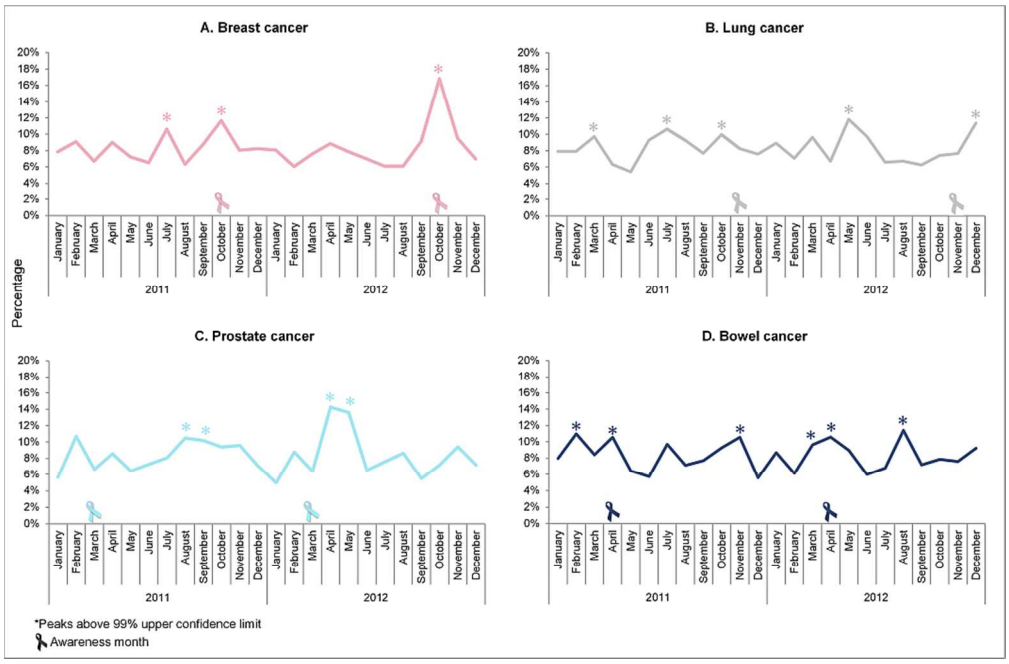

Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall
90x58mm (300 x 300 DPI)

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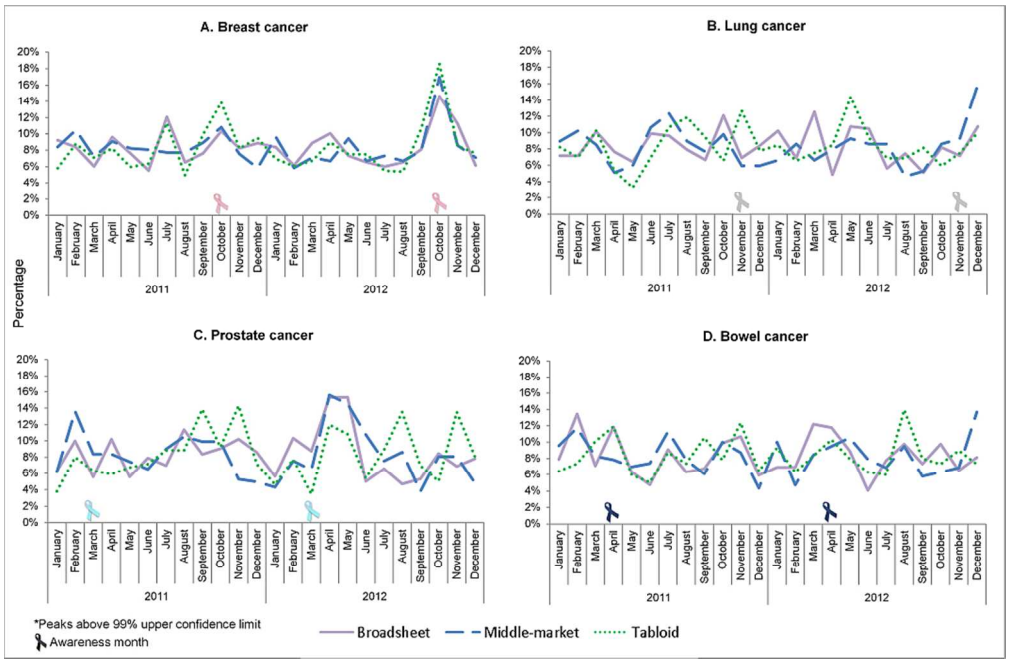

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category
90x58mm (300 x 300 DPI)

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Coverage of common cancer types in UK national newspapers: A content analysis

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ABSTRACT

Objective: To determine whether recent newspaper coverage of the four most common cancer types relates to their relative burden and national awareness months, and to identify the subject focus during high coverage periods.

Design: Content analysis using the Nexis newspaper article database.

Setting: United Kingdom 2011-2012.

Outcome measures: Annual number and ranking, monthly proportions and subject of articles on breast, lung, bowel and prostate cancers.

Results: 9178 articles were identified during 2011 and 2012 featuring breast (4237), prostate (1757), lung (1746) and bowel (1438) cancer. Peaks in monthly proportions above the 99% upper confidence limit were identified for each. Breast cancer had the highest coverage of 12% and 17% during its awareness month. Smaller peaks (11%) were identified during Bowel Cancer Awareness month. Prostate cancer received high coverage in relation to the case of the man convicted of the Lockerbie bombing who had been diagnosed with the cancer, and lung cancer in relation to the deaths of celebrities. Breast cancer was covered most often overall and by newspaper category while the lower coverage of other cancer types did not consistently mirror the relative number of new cases each year. The peaks by newspaper category were similar to the overall coverage with few exceptions.

Conclusions: UK newspaper coverage of common cancer types other than breast appears under-represented relative to their population burden. Coverage of breast cancer and bowel cancer appear influenced by their awareness months, while prostate and lung cancer are influenced by other media stories. Health promoting public bodies and campaigners could learn from the success of Breast Cancer Awareness Month and work more closely with journalists to ensure relevant messages reach wider audiences.

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ARTICLE SUMMARY

Key messages

- Breast cancer received high coverage throughout the study period, consistent with the high number of cases diagnosed, while lung, prostate and bowel cancers were under-represented relative to their population burden. This suggests that cancer advocates and health promoting bodies need to find ways of increasing the media exposure of these cancer types.
- UK newspaper coverage of breast and bowel cancer in 2011 and 2012 was high during their awareness months, suggesting that cancer advocates had been more successful in reaching journalists with stories about these cancer types than for lung and prostate cancer.
- Many newspaper articles used personalisation and celebrity stories about cancer to attract their audiences. These could represent an opportunity for journalists and health promoting bodies to work together on including accurate and relevant population health messages.

Strengths and limitations

This study made novel use of an established comprehensive database and classification tool to identify the subject focus of newspaper articles. While this method allows a large number of articles to be assessed and to replicate and monitor the findings over time, a specific content analysis would reveal the more detailed messages and themes within them. National newspapers are a widespread form of media but others such as magazines, television, radio, online news and social media are not included and should be considered.

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INTRODUCTION

Breast, lung, prostate and bowel cancer were the four most commonly diagnosed cancer types in the UK in 2010, which collectively accounted for over 50% of cancer diagnoses.[1] These cancer types each have associated awareness months which are increasingly used by charities and other non-profit and public organisations to raise the profile of particular diseases, spread information about early symptoms or detection and raise funds for research or treatment. A leading example is Breast Cancer Awareness Month which was introduced to the United Kingdom by the charity Breast Cancer Care in 1993.[2] Bowel Cancer Awareness Month was established later in 2000,[3] followed by Lung Cancer Awareness Month in 2002[4] and Prostate Cancer Awareness Month in 2009.[5]

Given that most people do not meet medical professionals regularly the media is a valuable means of raising public awareness and knowledge about cancer and disseminating health information in general. Studies carried out in China, the United States and the United Kingdom found that newspaper coverage generally did not mirror population cancer burden when measured as incidence, mortality or prevalence.[6-8] This is not unexpected as the goals of mass media are generally information provision and entertainment. Journalists often need to deliver a story with 'human interest' which can mean cancer news items may be biased towards personal accounts and risk distorting perceptions of the disease burden in populations.[9] For example, stories about young female celebrities with cancer may create a false perception that the disease affects younger women more often than older women, such as the 'Kylie effect' resulting from the diagnoses of the Australian singer Kylie Minogue aged 36.[10] The attention the UK media gave to the diagnosis of the celebrity Jade Goody with cervical cancer and her wish to raise awareness of screening led to a national debate about its effectiveness in young women,[11] and an increase in screening coverage and information seeking.[12, 13] Aside from celebrity stories, media campaigns have been shown to influence cancer-related behaviours such as increasing cancer screening uptake in the US and Australia,[14-16] and reducing the use of sunbeds in Denmark.[17]

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National newspapers are one widespread medium for cancer awareness but no study has yet evaluated whether awareness months affect cancer coverage in the United Kingdom. This study aimed to quantify recent national newspaper coverage of the four most commonly diagnosed cancer types, in particular to determine whether coverage was related to their relative population burden and whether national awareness months influenced the number of articles published in the United Kingdom. It also aimed to identify the subject focus of the articles published during awareness months or other high coverage periods.

METHODS

Data were extracted from the well-established, searchable, news article database Nexis® UK.[18] The newspaper articles were identified by the keywords 'breast cancer', 'lung cancer', 'prostate cancer', 'bowel cancer', 'colorectal cancer', 'colon cancer' and 'rectal cancer'. The search was limited to newspaper articles published in 2011 and 2012 as the awareness month for prostate cancer had only started relatively recently, and the study intended to give a current picture of cancer coverage, forming the basis for future research. Articles were identified as those under the source category 'UK National Newspapers' and duplicates were eliminated. The national newspapers that the database included under this category were grouped into three categories, tabloid (Daily Star, Morning Star, The Mirror, The Sunday Mirror, The People and The Sun), middle-market (Daily Mail, The Mail on Sunday, The Express and The Sunday Express) and broadsheet (The Daily Telegraph, The Sunday Telegraph, The Guardian, The Observer, i, The Independent, Independent on Sunday, The Times and The Sunday Times).

For each cancer type, the number of articles published in a month was divided by the number of articles published that year. The mean number of articles was also calculated separately for the different newspaper categories, accounting for the difference in number of newspapers in each of the categories.

Peaks in coverage were identified as those above the 99% upper confidence limit for the mean by cancer type and publication year. These were then matched to the cancer awareness months – March

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for prostate, April for bowel, October for breast and November for lung cancer. Population burden was measured as the number of newly diagnosed cases in 2010 – the year for which the most recent statistics were available.

The subject focus of each article was assigned by Nexis using the LexisNexis SmartIndexing Technology™. This is a rule-based classification system developed by researchers and information professionals that is able to label articles with controlled vocabularies for the companies, industries, subjects, people and locations discussed within the documents. The system is regularly tested by Nexis and updated to ensure accuracy. In combination with source indexing, it is an easy and quick system to search for relevant articles by various sources or time periods.[19] At the beginning of 2013 there were 19 main subject areas which were further divided into 191 more specific subjects and articles may have been tagged with more than one subject. The main subjects contributing to peaks in coverage above the 99% upper confidence limit were identified to give a general overview and articles were read to identify specific events which may have led to the rise. This analysis was repeated for tabloid, middle-market and broadsheet newspaper categories separately.

RESULTS

A total of 9178 articles relating to the four most commonly diagnosed cancer types in the United Kingdom were identified for the study period with a similar number published in each year. In both years breast cancer and bowel cancer were consistently the most and least covered cancer types and this mirrored their ranking in terms of number of newly diagnosed cases (table 1). Generally the five main subject areas for all articles about each of the cancer types were ‘Medicine & Health’, ‘Population & Demographics’, ‘Science & Technology’, ‘Society, Social Welfare & Lifestyle’ and ‘Reports, Reviews & Sections’.

Overall coverage

Coverage of breast cancer was the most frequent in both years with a total of 4237 articles. Peaks in its coverage were in July and October 2011, and October 2012 (figure 1A). Coverage in July 2011, which made up 11% of the published articles in that year, had a high proportion of articles tagged

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under the subject area 'Sports & Recreation'. These articles referred to the case of a golf champion's wife who had died from breast cancer. October 2011 and 2012 had the highest proportions of coverage, 12% in 2011 and 17% in 2012, which coincided with Breast Cancer Awareness Month. The subject focus of these articles was still concentrated around the top five main subject areas.

Prostate cancer was the second most frequently mentioned cancer overall, being covered by 1757 articles. The proportions peaked in February, August, and September 2011 at around 10%, and April and May 2012 at 14% (figure 1C). These peaks all had a notable proportion of articles tagged under the subject area 'International Relations & National Security' and these were mainly associated with the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. None of these peaks coincided with Prostate Cancer Awareness Month which takes place in March.

Lung cancer followed closely with 1746 articles over the two years. Peaks in the proportions of articles were identified in March, July and October 2011 at around 10% (figure 1B). In 2012 peaks were observed in May and December at over 11%. March 2011 saw a rise in articles relating to 'Government & Public Administration', which were generally concerned with articles relating to compensation for victims of asbestos exposure. July 2011 saw a rise in articles that were confined to the top five main subject areas. There was also a rise in articles tagged under the subject area 'Humanities & Social Sciences' for the months October 2011, May and December 2012; these were mainly covering stories about deaths from lung cancer, particularly of celebrities. There were no peaks in coverage observed during the cancer awareness month in November.

Bowel cancer was covered by 1438 newspaper articles during the study period. The peaks in proportions were observed in February, April, November 2011, each at around 10% (figure 1D). In 2012 the peaks were observed during March to April at around 10% and August at 11%. All of the peaks consisted of articles assigned to the five main subject areas. There were peaks during Bowel Cancer Awareness Month in April 2011 and 2012 covering topics common to the rest of the year.

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Coverage by newspaper category

When coverage was examined by newspaper category, breast cancer had the highest mean number of articles published over the two-year period, 266 by tabloid, 265 by middle-market and 175 by broadsheet (table 2). The mean number of related articles was less than 130 for cancer types other than breast cancer in any category of newspaper.

A majority of the peaks observed by newspaper category were the same as the overall picture, or had no specific contributing event (figure 2). The exceptions were for lung cancer peaks in broadsheet newspapers during June 2011 and March 2012 (figure 2B). The peak in June 2011 was related to the peace campaigner Brian Haw who died from lung cancer and was also observed in middle-market newspapers. March 2012 saw a rise in articles covering the success of a legal battle for compensation payments to sufferers of asbestos-related cancers. For prostate cancer, the only unique peak was observed for August 2012 in tabloid newspapers and was related to articles about the risks of eating fried meat and prostate cancer (figure 2C). Bowel cancer had a peak in middle-market newspapers for July 2011 which was related to the risk of death from side-effects of capecitabine, a drug used to treat this cancer (figure 2D).

DISCUSSION

Summary of main findings

This study using the Nexis newspaper database found that UK national newspaper coverage of common cancer types did not always mirror the burden of newly diagnosed cases. During 2011, breast cancer and bowel cancer were the most and least commonly covered cancer types of those studied, but the coverage of lung and prostate cancer was not consistent with their burden. However, newspaper coverage in 2012 did mirror the ranking of newly diagnosed cases for all of the cancer types studied. Breast cancer was consistently the most commonly covered cancer by each of the tabloid, middle-market and broadsheet newspaper categories; although only in the latter group did the ranking of coverage mirror the relative disease burden. As well as breast cancer being highly reported throughout the two-year study period there were notable peaks coinciding with Breast Cancer

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Awareness Month in each October, both overall and by each newspaper category. The high proportion of breast cancer articles tagged under the most common subject areas of 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections' during almost every month indicate that journalists and editors were generally prone to reporting articles under a limited number of subjects. However, there was high coverage of the case of a golf champion's wife who had died from breast cancer supporting the idea that newspapers are responsive to reporting breast cancer in the context of personalisation. Considering the similar number of people diagnosed with prostate cancer each year this cancer was under-represented in comparison with breast cancer. There was no rise in articles during its official awareness month in March. Instead, peaks in coverage were triggered by the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. Tabloid newspapers also had a peak in coverage of prostate cancer related to an increased risk caused by eating fried meat. In this case tabloid newspapers were more likely to report on scientific research with a causation message compared with broadsheet and middle-market newspapers.

Peaks in articles relating to lung cancer were generally concerned with personal stories, such as asbestos exposure or cases of celebrities who had died from the disease. Bowel cancer articles covered a range of subjects with peaks triggered by events tagged under the five main subject areas. The exception was a peak in middle-market newspapers' coverage, which had a small proportion of articles related to side effects of a bowel cancer drug. There were also peaks during its cancer awareness month in April in both tabloid and broadsheet newspapers suggesting that journalists for these newspapers may have attempted to increase their coverage of bowel cancer during the campaign period.

Comparison to other studies

That breast cancer dominates media coverage in newspapers as well as magazines, television news broadcasts and online news is a consistent finding with previous research.[6, 8, 9, 20-23] It has been suggested that this is likely to be due to the early establishment and effective marketing models used

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by breast cancer campaigners.[7, 24] Breast Cancer Awareness Month triggered heightened news coverage in this study and in the United States.[25]

Prostate cancer was one of the most frequent cancer types mentioned in previous studies of newspapers, magazines and online news.[6, 20, 22] Some also found that its coverage was under-represented, especially since the number of new diagnoses is similar to breast cancer.[9, 22] One reason for this may be that Prostate Cancer Awareness Month was introduced later than that for breast cancer. Another reason may be that the difficulty of screening for and identifying its early symptoms means that there is no national UK screening programme for newspapers to promote, unlike the widespread discussion in some other countries such as the United States.[26]

Lung cancer was the second most commonly reported cancer in this study, consistent with other analyses of newspaper coverage.[6, 9] Other studies have also found this cancer was heavily under-represented considering its high incidence and mortality rate.[6-8] The exception was one of Japanese newspapers that found lung cancer coverage to be the highest, consistent with mortality rates in Japan.[27] This may be because Japanese newspapers covered a high proportion of death-related articles - a common subject for lung cancer articles in this and in one US study.[7]

Bowel cancer was the least covered cancer type in this study. This study and others have found that media coverage of bowel cancer was generally under-represented relative to its burden.[6, 8, 21] The peaks in newspaper coverage identified here in April, coinciding with Bowel Cancer Awareness Month do however suggest an increasing success for this initiative. Similarly a Swiss study found that a bowel cancer campaign led to increased newspaper coverage confined to the campaign period.[28] The other peaks identified in the current study consisted of articles relating to the common subject areas and were not related to any particular event. Another study carried out on UK national newspapers found that almost half of newspaper articles mentioning bowel cancer were not actually relevant to the cancer.[29]

The influence of celebrity cases on UK national newspaper coverage was observed in varying degrees across all of the cancer types studied although some were of relatively low-profile cases compared

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with the well-studied example of television celebrity Jade Goody whose experience with cervical cancer increased screening among British women.[30, 31] In the United States cases of bowel cancer associated with high-profile figures has also led to a corresponding increase in the use of early detection tests.[32, 33]

Strengths and potential limitations

This study was unique in examining the influence of cancer awareness months on coverage in UK national newspapers. It was able to make use of existing classification tools to identify the focus of the articles retrieved, but this depends on the subjects already assigned rather than a new content analysis of the articles. The national newspapers included in this study although comprehensive and representative, were part of a predefined category provided by Nexis and thus may be incomplete. However, the resource is well-established and will allow for more consistent replication of the methods used in the future. This study only examined newspapers, and while they remain a popular and widespread source of information, other media such as magazines, television broadcasts, radio, online news and social media are also important. In addition, the exploratory nature of this study meant that there was no examination of the content quality of the articles, but it can be argued that quantity will have a more powerful effect on public perceptions of disease.

Implications for policy and practice

Awareness months can only ever be one aspect of health promotion efforts to influence awareness of particular diseases, knowledge of when to act on particular symptoms, and individual behaviour change in response to them. Although there is some evidence that raising awareness of certain cancer types leads to earlier diagnosis or improved outcomes, this area of research still needs to be developed before effective interventions can be recommended.[34] Under-representation of cancer types relative to their burden may, however, still impact on public knowledge and perceptions of risk, and on policies such as funding support.[35, 36] While using personal experiences is an engaging method for profit-making media it is important that medical journalists ensure that accurate and relevant

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messages are presented in their articles whether in the context of a celebrity case or a specific awareness piece.

The marketing models employed by advocates during Breast Cancer Awareness Month have been successful at influencing the news coverage in US newspapers and subsequently affected health behaviours such as internet search activity.[37] The increased UK newspaper coverage seen in this study for breast cancer and bowel cancer during their awareness months but not for prostate and lung cancer suggests that advocates should examine the methods used to promote breast and bowel cancer since evidence suggests that the media are responsive to such campaigning.[9] Peaks of media coverage were also confined to campaign periods and so a further challenge is to sustain relevant, accurate and appropriate messages to the public. Medical professionals, health promoting public bodies and charities should collaborate more closely with medical journalists to ensure that relevant information is incorporated into articles, especially those reporting unpredictable news stories. Although the use of other media is increasing, newspapers may still be able to present the symptoms and treatment of some cancer types in an appealing manner which can make health promotion using other media difficult. For example, in one study bowel cancer was more commonly covered by newspapers than magazines or television broadcasts compared with breast cancer.[7] In addition, newspapers serve as a relatively low-cost route to reach a large, national audience. This study was unique in examining coverage by different categories of newspapers and found some minor distinction between the coverage of common cancer types. Different categories of newspaper attract audiences with similar characteristics and understanding this could help target and tailor messages to the at-risk groups. Health promoting public bodies could also consider the use of extensive social media which may also have a positive effect on health behaviours.[17]

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Table 1: Number of newly diagnosed cancer cases in the UK in 2010 and number of articles mentioning breast, lung, prostate and bowel cancers in UK national newspapers, 2011-2012

Cancer type	Number of new cases in 2010[1]			Number of articles (rank)	
	Persons	Males	Females	2011	2012
Breast	49961	397	49564	2102 (1)	2135 (1)
Lung	42026	23175	18851	884 (3)	862 (2)
Prostate	40975	40975	-	992 (2)	765 (3)
Bowel	40695	22834	17861	701 (4)	737 (4)

[1] Cancer Research UK. UK Cancer Incidence (2010) by Country Summary 2013 [cited 2014 23 May]. Available from: http://publications.cancerresearchuk.org/downloads/Product/CS_DT_INCCOUNTRIES.pdf.

Table 2: Mean number of articles mentioning breast, lung, prostate and bowel cancers by newspaper category, 2011-2012

Newspaper category (number of newspapers)	Cancer type			
	Breast	Lung	Prostate	Bowel
Broadsheet (9)	175	88	83	55
Middle-market (4)	265	97	127	105
Tabloid (6)	266	94	83	87

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Data sharing statement: The data used for this study was accessed by authorised, non-transferable subscription to the Nexis® database https://www.lexisnexis.com/uk/nexis/. Due to licensing agreements, interested parties will need to subscribe to this online service to retrieve data used in this study for similar research.

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Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category

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~~Do awareness months affect the coverage of common cancer types in UK national newspapers?~~

~~Thematic analysis~~

Coverage of common cancer types in UK national newspapers: A content analysis

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ABSTRACT

Objective: To determine whether recent newspaper coverage of the four most common cancer types relates to their relative burden and national awareness months, and to identify the subject focus during high coverage periods.

Design: Content ~~Thematic~~ analysis using the Nexis newspaper article database.

Setting: United Kingdom 2011-2012.

Outcome measures: Annual number and ranking, monthly proportions and subject of articles on breast, lung, bowel and prostate cancers.

Results: 9178 articles were identified during 2011 and 2012 featuring breast (4237), prostate (1757), lung (1746) and bowel (1438) cancer. Peaks in monthly proportions above the 99% upper confidence limit were identified for each. Breast cancer had the highest coverage of 12% and 17% during its awareness month. Smaller peaks (11%) were identified during Bowel Cancer Awareness month. Prostate cancer received high coverage in relation to the case of the man convicted of the Lockerbie bombing who had been diagnosed with the cancer, and lung cancer in relation to the deaths of celebrities. Breast cancer was covered most often overall and by newspaper category while the lower coverage of other cancer types did not consistently mirror the relative number of new cases each year. The peaks by newspaper category were similar to the overall coverage with few exceptions.

Conclusions: UK newspaper coverage of common cancer types other than breast appears under-represented relative to their population burden. Coverage of breast cancer and bowel cancer appear influenced by their awareness months, while prostate and lung cancer are influenced by other media stories. Health promoting public bodies and campaigners could learn from the success of Breast Cancer Awareness Month and work more closely with journalists to ensure relevant messages reach wider audiences.

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ARTICLE SUMMARY

Key messages

- Breast cancer received high coverage throughout the study period, consistent with the high number of cases diagnosed, while lung, prostate and bowel cancers were under-represented relative to their population burden. This suggests that cancer advocates and health promoting bodies need to find ways of increasing the media exposure of these cancer types.
- UK newspaper coverage of breast and bowel cancer in 2011 and 2012 was high during their awareness months, suggesting that cancer advocates had been more successful in reaching journalists with stories about these cancer types than for lung and prostate cancer.
- Many newspaper articles used personalisation and celebrity stories about cancer to attract their audiences. These could represent an opportunity for journalists and ~~health-promoting~~ health promoting bodies to work together on including accurate and relevant population health messages.

Strengths and limitations

This study made novel use of an established comprehensive database and classification tool to identify the subject focus of newspaper articles. While this method allows a large number of articles to be assessed and to replicate and monitor the findings over time, a specific content analysis would reveal the more detailed messages and themes within them. National newspapers are a widespread form of media but others such as magazines, television, radio, online news and social media are not included and should be considered.

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INTRODUCTION

Breast, lung, prostate and bowel cancer were the four most commonly diagnosed cancer types in the UK in 2010, which collectively accounted for over 50% of cancer diagnoses.[1] These cancer types each have associated awareness months which are increasingly used by charities and other non-profit and public organisations to raise the profile of particular diseases, spread information about early symptoms or detection and raise funds for research or treatment. A leading example is Breast Cancer Awareness Month which was introduced to the United Kingdom by the charity Breast Cancer Care in 1993.[2] Bowel Cancer Awareness Month was established later in 2000,[3] followed by Lung Cancer Awareness Month in 2002[4] and Prostate Cancer Awareness Month in 2009.[5]

Given that most people do not meet medical professionals regularly the media is a valuable means of raising public awareness and knowledge about cancer and disseminating health information in general. Studies carried out in China, the United States and the United Kingdom found that newspaper coverage generally did not mirror population cancer burden when measured as incidence, mortality or prevalence.[6-8] This is not unexpected as the goals of mass media are generally information provision and entertainment. Journalists often need to deliver a story with 'human interest' which can mean cancer news items may be biased towards personal accounts and risk distorting perceptions of the disease burden in populations.[9] For example, stories about young female celebrities with cancer may create a false perception that the disease affects younger women more often than older women, such as the 'Kylie effect' resulting from the diagnoses of the Australian singer Kylie Minogue aged 36.[10] The attention the UK media gave to the diagnosis of the celebrity Jade Goody with cervical cancer and her wish to raise awareness of screening led to a national debate about its effectiveness in young women,[11] and an increase in screening coverage and information seeking.[12, 13] Aside from celebrity stories, media campaigns have been shown to influence cancer-related behaviours such as increasing cancer screening uptake in the US and Australia,[14-16] and reducing the use of sunbeds in Denmark.[17]

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National newspapers are one widespread medium for cancer awareness but no study has yet evaluated whether awareness months affect cancer coverage in the United Kingdom. This study aimed to quantify recent national newspaper coverage of the four most commonly diagnosed cancer types, in particular to determine whether coverage was related to their relative population burden and whether national awareness months influenced the number of articles published in the United Kingdom. It also aimed to identify the subject focus of the articles published during awareness months or other high coverage periods.

METHODS

Data were extracted from the well-established, searchable, news article database Nexis® UK.[18] The newspaper articles were identified by the keywords 'breast cancer', 'lung cancer', 'prostate cancer', 'bowel cancer', 'colorectal cancer', 'colon cancer' and 'rectal cancer'. The search was limited to newspaper articles published in 2011 and 2012 as the ~~prostate cancer awareness month~~ awareness month for prostate cancer had only started relatively recently, and the study intended to give a current picture of cancer coverage, forming the basis for future research. Articles were identified as those under the source category 'UK National Newspapers' and duplicates were eliminated. The national newspapers that the database included under this category were grouped into three categories, tabloid (Daily Star, Morning Star, The Mirror, The Sunday Mirror, The People and The Sun), middle-market (Daily Mail, The Mail on Sunday, The Express and The Sunday Express) and broadsheet (The Daily Telegraph, The Sunday Telegraph, The Guardian, The Observer, i, The Independent, Independent on Sunday, The Times and The Sunday Times).

For each cancer type, the number of articles published in a month was divided by the number of articles published that year. The mean number of articles was also calculated separately for the different newspaper categories, accounting for the difference in number of newspapers in each of the categories.

Peaks in coverage were identified as those above the 99% upper confidence limit for the mean by cancer type and publication year. These were then matched to the cancer awareness months – March

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for prostate, April for bowel, October for breast and November for lung cancer. Population burden was measured as the number of newly diagnosed cases in 2010 – the year for which the most recent statistics were available.

The subject focus of each article was assigned by Nexis using the LexisNexis SmartIndexing Technology™. This is a rule-based classification system developed by researchers and information professionals that is able to label articles with controlled vocabularies for the companies, industries, subjects, people and locations discussed within the documents. The system is regularly tested by Nexis and updated to ensure accuracy. In combination with source indexing, it is an easy and quick system to search for relevant articles by various sources or time periods.[19] At the beginning of 2013 there were 19 main subject areas which were further divided into 191 more specific subjects and articles may have been tagged with more than one subject. The main subjects contributing to peaks in coverage above the 99% upper confidence limit were identified to give a general overview and articles were read to identify specific events which may have led to the rise. This analysis was repeated for tabloid, middle-market and broadsheet newspaper categories separately.

RESULTS

A total of 9178 articles relating to the four most commonly diagnosed cancer types in the United Kingdom were identified for the study period with a similar number published in each year. In both years breast cancer and bowel cancer were consistently the most and least covered cancer types and this mirrored their ranking in terms of number of newly diagnosed cases (table 1). Generally the five main subject areas for all articles about each of the cancer types were ‘Medicine & Health’, ‘Population & Demographics’, ‘Science & Technology’, ‘Society, Social Welfare & Lifestyle’ and ‘Reports, Reviews & Sections’.

Overall coverage

Coverage of breast cancer was the most frequent in both years with a total of 4237 articles. Peaks in its coverage were in July and October 2011, and October 2012 (figure 1A). Coverage in July 2011, which made up 11% of the published articles in that year, had a high proportion of articles tagged

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under the subject area 'Sports & Recreation'. These articles referred to the case of a golf champion's wife who had died from breast cancer. October 2011 and 2012 had the highest proportions of coverage, 12% in 2011 and 17% in 2012, which coincided with Breast Cancer Awareness Month. The subject focus of these articles was still concentrated around the top five main subject areas.

Prostate cancer was the second most frequently mentioned cancer overall, being covered by 1757 articles. The proportions peaked in February, August, and September 2011 at around 10%, and April and May 2012 at 14% (figure 1C). These peaks all had a notable proportion of articles tagged under the subject area 'International Relations & National Security' and these were mainly associated with the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. None of these peaks coincided with Prostate Cancer Awareness Month which takes place in March.

Lung cancer followed closely with 1746 articles over the two years. Peaks in the proportions of articles were identified in March, July and October 2011 at around 10% (figure 1B). In 2012 peaks were observed in May and December at over 11%. March 2011 saw a rise in articles relating to 'Government & Public Administration', which were generally concerned with articles relating to compensation for victims of asbestos exposure. July 2011 saw a rise in articles that were confined to the top five main subject areas. There was also a rise in articles tagged under the subject area 'Humanities & Social Sciences' for the months October 2011, May and December 2012; these were mainly covering stories about deaths from lung cancer, particularly of celebrities. There were no peaks in coverage observed during the cancer awareness month in November.

Bowel cancer was covered by 1438 newspaper articles during the study period. The peaks in proportions were observed in February, April, November 2011, each at around 10% (figure 1D). In 2012 the peaks were observed during March to April at around 10% and August at 11%. All of the peaks consisted of articles assigned to the five main subject areas. There were peaks during Bowel Cancer Awareness Month in April 2011 and 2012 covering topics common to the rest of the year.

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Coverage by newspaper category

When coverage was examined by newspaper category, breast cancer had the highest mean number of articles published over the two-year period, 266 by tabloid, 265 by middle-market and 175 by broadsheet (table 2). The mean number of related articles was less than 130 for cancer types other than breast cancer in any category of newspaper.

A majority of the peaks observed by newspaper category were the same as the overall picture, or had no specific contributing event (figure 2). The exceptions were for lung cancer peaks in broadsheet newspapers during June 2011 and March 2012 (figure 2B). The peak in June 2011 was related to the peace campaigner Brian Haw who died from lung cancer and was also observed in middle-market newspapers. March 2012 saw a rise in articles covering the success of a legal battle for compensation payments to sufferers of asbestos-related cancers. For prostate cancer, the only unique peak was observed for August 2012 in tabloid newspapers and was related to articles about the risks of eating fried meat and prostate cancer (figure 2C). Bowel cancer had a peak in middle-market newspapers for July 2011 which was related to the risk of death from side-effects of capecitabine, a drug used to treat this cancer (figure 2D).

DISCUSSION

Summary of main findings

This study using the Nexis newspaper database found that UK national newspaper coverage of common cancer types did not always mirror the burden of newly diagnosed cases. During 2011, breast cancer and bowel cancer were the most and least commonly covered cancer types of those studied, but the coverage of lung and prostate cancer was not consistent with their burden. However, newspaper coverage in 2012 did mirror the ranking of newly diagnosed cases for all of the cancer types studied. Breast cancer was consistently the most commonly covered cancer by each of the tabloid, middle-market and broadsheet newspaper categories; although only in the latter group did the ranking of coverage mirror the relative disease burden. As well as breast cancer being highly reported throughout the two-year study period there were notable peaks coinciding with Breast Cancer

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Awareness Month in each October, both overall and by each newspaper category. The high proportion of breast cancer articles tagged under the most common subject areas of 'Medicine & Health', 'Population & Demographics', 'Science & Technology', 'Society, Social Welfare & Lifestyle' and 'Reports, Reviews & Sections' during almost every month indicate that journalists and editors were generally prone to reporting articles under a limited number of subjects. However, there was high coverage of the case of a golf champion's wife who had died from breast cancer supporting the idea that newspapers are responsive to reporting breast cancer in the context of personalisation. Considering the similar number of people diagnosed with prostate cancer each year this cancer was ~~under-reported~~ under-represented in comparison with breast cancer. There was no rise in articles during its official awareness month in March. Instead, peaks in coverage were triggered by the case of the man convicted of the Lockerbie bombing who had been diagnosed with prostate cancer. Tabloid newspapers also had a peak in coverage of prostate cancer related to an increased risk caused by eating fried meat. In this case tabloid newspapers were more likely to report on scientific research with a causation message compared with broadsheet and middle-market newspapers.

Peaks in articles relating to lung cancer were generally concerned with personal stories, such as asbestos exposure or cases of celebrities who had died from the disease. Bowel cancer articles covered a range of subjects with peaks triggered by events tagged under the five ~~most common subjects~~ main subject areas. The exception was a peak in middle-market newspapers' coverage, which had a small proportion of articles related to side effects of a bowel cancer drug. There were also peaks during its cancer awareness month in April in both tabloid and broadsheet newspapers suggesting that journalists for these newspapers may have attempted to increase their coverage of bowel cancer during the campaign period.

Comparison to other studies

That breast cancer dominates media coverage in newspapers as well as magazines, television news broadcasts and online news is a consistent finding with previous research.[6, 8, 9, 20-23] It has been suggested that this is likely to be due to the early establishment and effective marketing models used

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by breast cancer campaigners.[7, 24] Breast Cancer Awareness Month triggered heightened news coverage in this study and in the United States.[25]

Prostate cancer was one of the most frequent cancer types mentioned in previous studies of newspapers, magazines and online news.[6, 20, 22] Some also found that its coverage was ~~under-reported~~ under-represented, especially since the number of new diagnoses is similar to breast cancer.[9, 22] One reason for this may be that Prostate Cancer Awareness Month was introduced later than that for breast cancer. Another reason may be that the difficulty of screening for and identifying its early symptoms means that there is no national UK screening programme for newspapers to promote, unlike the widespread discussion in some other countries such as the United States.[26]

Lung cancer was the second most commonly reported cancer in this study, consistent with other analyses of newspaper coverage.[6, 9] Other studies have also found this cancer was heavily ~~under-reported~~ under-represented considering its high incidence and mortality rate.[6-8] The exception was one of Japanese newspapers that found lung cancer coverage to be the highest, consistent with mortality rates in Japan.[27] This may be because Japanese newspapers covered a high proportion of death-related articles - a common subject for lung cancer articles in this and in one US study.[7]

Bowel cancer was the least covered cancer type in this study. This study and others have found that media coverage of bowel cancer was generally ~~under-reported~~ under-represented relative to its burden.[6, 8, 21] The peaks in newspaper coverage identified here in April, coinciding with Bowel Cancer Awareness Month do however suggest an increasing success for this initiative. Similarly a Swiss study found that a bowel cancer campaign led to increased newspaper coverage confined to the campaign period.[28] The other peaks identified in the current study consisted of articles relating to the common subject areas and were not related to any particular event. Another study carried out on UK national newspapers found that almost half of newspaper articles mentioning bowel cancer were not actually relevant to the cancer.[29]

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The influence of celebrity cases on UK national newspaper coverage was observed in varying degrees across all of the cancer types studied although some were of relatively low-profile cases compared with the well-studied example of television celebrity Jade Goody whose experience with cervical cancer increased screening among British women.[30, 31] In the United States cases of bowel cancer associated with high-profile figures has also led to a corresponding increase in the use of early detection tests.[32, 33]

Strengths and potential limitations

This study was unique in examining the influence of cancer awareness months on coverage in UK national newspapers. It was able to make use of existing classification tools to identify the focus of the articles retrieved, but this depends on the subjects already assigned rather than a new content analysis of the articles. The national newspapers included in this study although comprehensive and representative, were part of a predefined category provided by Nexis and thus may be incomplete. However, the resource is well-established and will allow for more consistent replication of the methods used in the future. This study only examined newspapers, and while they remain a popular and widespread source of information, other media such as magazines, television broadcasts, radio, online news and social media are also important. In addition, the exploratory nature of this study meant that there was no examination of the content quality of the articles, but it can be argued that quantity will have a more powerful effect on public perceptions of disease.

Implications for policy and practice

Awareness months can only ever be one aspect of health promotion efforts to influence awareness of particular diseases, knowledge of when to act on particular symptoms, and individual behaviour change in response to them. Although there is some evidence that raising awareness of certain cancer types leads to earlier diagnosis or improved outcomes, this area of research still needs to be developed before effective interventions can be recommended.[34] Under-representation of cancer types relative to their burden may, however, still impact on public knowledge and perceptions of risk, and on policies such as funding support.[35, 36] While using personal experiences is an engaging method for

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profit-making media it is important that medical journalists ensure that accurate and relevant messages are presented in their articles whether in the context of a celebrity case or a specific awareness piece.

The marketing models employed by ~~activists~~ advocates during Breast Cancer Awareness Month have been successful at influencing the news coverage in US newspapers and subsequently affected health behaviours such as internet search activity.[37] The increased UK newspaper coverage seen in this study for breast cancer and bowel cancer during their awareness months but not for prostate and lung cancer suggests that ~~campaigners~~ advocates should examine the methods used to promote ~~the methods of~~ breast and bowel cancer ~~activists~~ since evidence suggests that the media are responsive to such campaigning.[9] Peaks of media coverage were also confined to campaign periods and so a further challenge is to sustain relevant, accurate and appropriate messages to the public. Medical professionals, health promoting public bodies and charities should collaborate more closely with medical journalists to ensure that relevant information is incorporated into articles, especially those reporting unpredictable news stories. Although the use of other media is increasing, newspapers may still be able to present the symptoms and treatment of some cancer types in an appealing manner which can make health promotion using other media difficult. For example, in one study bowel cancer was more commonly covered by newspapers than magazines or television broadcasts compared with breast cancer.[7] In addition, newspapers serve as a relatively low-cost route to reach a large, national audience. This study was unique in examining coverage by different ~~types~~ categories of newspapers and found some minor distinction between the coverage of common cancer types. Different ~~newspaper categories~~ categories of newspaper attract audiences with similar characteristics and understanding this could help target and tailor messages to the at-risk groups. Health promoting public bodies could also consider the use of extensive social media which may also have a positive effect on health behaviours.[17]

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Table 1: Number of newly diagnosed cancer cases in the UK in 2010 and number of articles mentioning breast, lung, prostate and bowel cancers in UK national newspapers, 2011-2012

Cancer type	Number of new cases in 2010[1]			Number of articles (rank)	
	Persons	Males	Females	2011	2012
Breast	49961	397	49564	2102 (1)	2135 (1)
Lung	42026	23175	18851	884 (3)	862 (2)
Prostate	40975	40975	-	992 (2)	765 (3)
Bowel	40695	22834	17861	701 (4)	737 (4)

[1] Cancer Research UK. UK Cancer Incidence (2010) by Country Summary 2013 [cited 2014 23 May]. Available from: http://publications.cancerresearchuk.org/downloads/Product/CS_DT_INCCOUNTRIES.pdf.

Table 2: Mean number of articles mentioning breast, lung, prostate and bowel cancers by newspaper category, 2011-2012

Newspaper category (number of newspapers)	Cancer type			
	Breast	Lung	Prostate	Bowel
Broadsheet (9)	175	88	83	55
Middle-market (4)	265	97	127	105
Tabloid (6)	266	94	83	87

Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category

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Data sharing statement: The data used for this study was accessed by authorised, non-transferable subscription to the Nexis® database https://www.lexisnexis.com/uk/nexis/. Due to licensing agreements, interested parties will need to subscribe to this online service to retrieve data used in this study for similar research.

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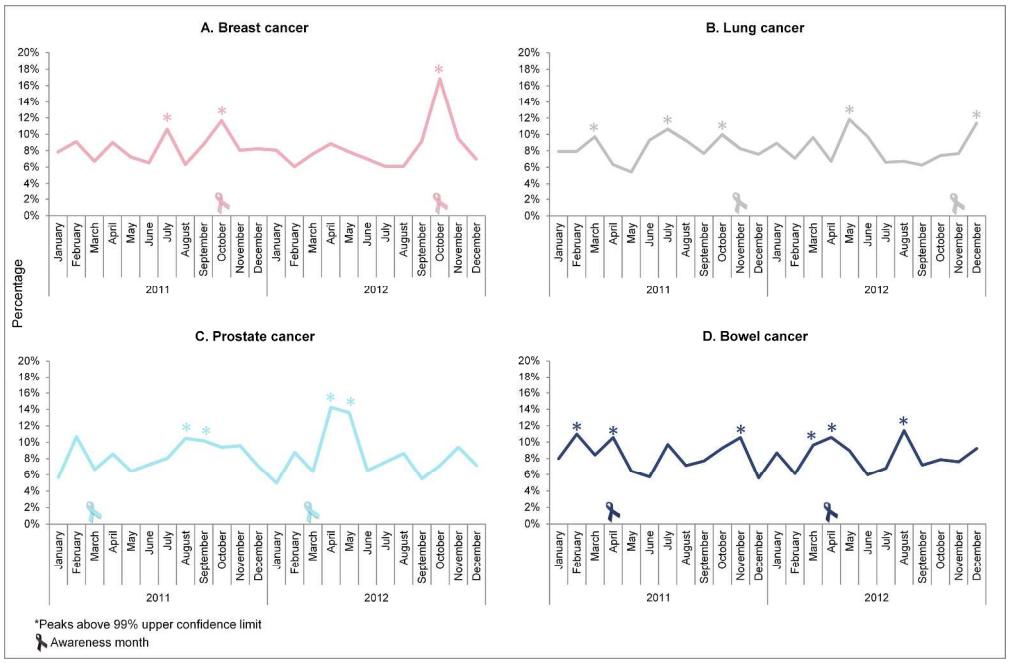

Figure 1: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) in UK National newspapers overall
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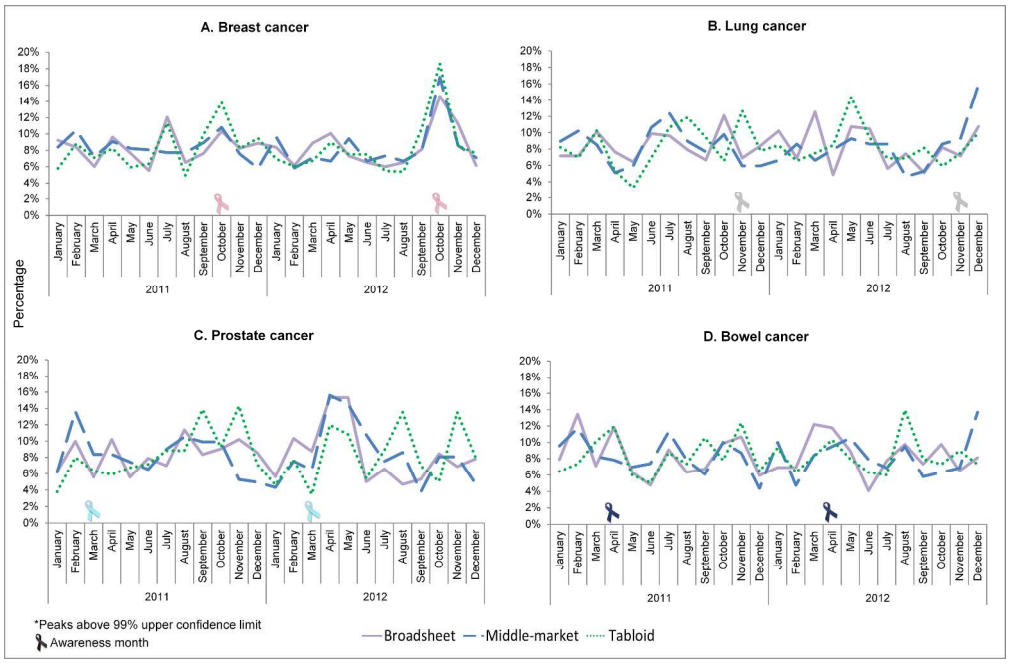

Figure 2: Proportion of breast, lung, prostate and bowel cancer articles published per month (in 2011 and 2012) by newspaper category
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