Reporting diet-related health issues through newspapers: portrayal of cardiovascular disease and Type 2 diabetes

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Abstract

This study identifies (i) the extent to which newsprint media communicate to their readers the lifestyle factors associated with the development of cardiovascular disease and Type 2 diabetes and (ii) newspaper portrayal of social determinants affecting onset of disease. A content analysis of five leading UK national newspapers and their Sunday equivalents was conducted over a 3-month period between January and March 2008. This study shows that cardiovascular disease had much higher press interest than Type 2 diabetes. ‘Middle-market’ and ‘Quality’ papers had higher levels of reporting than the ‘Popular’ press, but the patterns were more complex when the comprehensiveness of reporting was measured within each article. Social determinants affecting disease onset were poorly reported by newspapers, supporting similar research conducted in other countries. This research identifies that there is potential for newspapers to improve their reporting of lifestyle diseases, by including individual and social determinants of disease onset. Lower social classes who read the popular press receive the lowest frequency of reporting and could benefit most from this information. While the research identifies that newspapers are missing the potential to actively communicate and reinforce government health policy, it recognises that the commercial context of the print media may counter such behaviour.

Introduction

The incidence of non-communicable diseases (NCDs) is predicted to increase between 2006 and 2015. The World Health Organization (WHO) predicts that cardiovascular disease (CVD) deaths will increase by 17% globally taking the total global CVD deaths to 20 million per year [1, 2]. The incidence of Type 2 diabetes mellitus (T2DM) in industrialized countries has also been predicted to rise from 51 to 72 million people, a 42% increase by 2025 despite a stable population [3].

There is clear evidence that risk reduction or prevention of early onset of CVD and T2DM have been associated with individual lifestyle choices [4]. An example of this is the increased incidence of these diseases when related to levels of physical inactivity [3, 5]. To aid the prevention of NCDs, it is essential that the public is provided with reliable, accurate and accessible sources of information about measures they can take for themselves. It has been shown that health outcomes are improved when people have early access to the correct information and/or early diagnosis [3]. Getting people to alter their behaviour is complicated. Although providing people with information may not result in immediate or sustained behaviour change, in the appropriate environment, some people may make...
lifestyle modifications [6]. In the United Kingdom, while the government is responsible for the provision of public health information through general practitioners and public service media (see www.nhsdirect.nhs.uk), the public may also consult less formal sources of information, such as magazines, the Internet, newspapers and television [7]. For health information to be acted on, it must be presented in a clear and relevant manner to the public. The media can help provide information and reinforce key health messages as long as the information they provide is accurate and complete.

As one aspect of the media, newspapers are important sources of information, with McNair noting that 80% of British adults read a national newspaper. A survey conducted in 1990 revealed that newspapers are more important than family and friends in influencing opinions [8]. There are many different media sources providing news information, but consumers are best at assimilating printed information, such as newspapers in comparison to information from television advertisements [9]. Media has been considered to be a key communicator for the effective transfer of health information to the public. Newspapers have been shown to be a particular important facet in influencing attitudes. They allow products, services, ideas and attitudes to be presented in a different and original way in a complementary format to other promotional material [10]. However, reading newspapers has declined as the public look to alternative media, such as the Internet and television for information. Newspapers have responded by adapting their structure, adopting a more local orientation and focusing on attractive design all of which have been shown to enhance newspaper circulation [11]. News media are commercial organizations; the inclusion of health information will be determined by its likelihood to appeal to the perceived reader’s interests as well as the maintenance or enhancement of circulation figures, rather than as a public service per se.

Research has shown that newspapers are guided by press releases from scientific journals including the BMJ and The Lancet [12, 13]. These are made more easily available through facilities such as the EurekAlert! press release aggregation website, which provides a powerful tool for reporters, collecting press releases from academic journals and research organizations. Newspapers will only report information that is readily available to time-constrained reporters.

When presenting information on health issues, newspapers need to be perceived as trustworthy and accurate in their content as well as providing the information in a way that will be attractive for circulation and understandable to their readers. Press coverage has been identified, at times, to be inaccurate, superficial, sensationalized and of failing to examine bias and conflicts of interest; moreover, news stories are frequently not covered or followed up due to not being deemed newsworthy [14]. More emphasis has been placed on emerging threats to health including SARS and bioterrorism, which generated 100 000 media reports but accounted for a few deaths, while smoking and physical inactivity had far less media attention but kill almost 800 000 people a year [15].

Lack of newspaper coverage of CVD has been associated with perceived mortality and it has been suggested that health professionals should build relationships with the media to ensure diseases are accurately portrayed [16]. In their defence, journalists report that due to space constraints, they can only provide summaries of scientific research and that bad, sexy or quirky news is more likely to be covered to capture the reader’s attention and improve ratings [12, 13]. It has also been demonstrated that newspapers are perceived by readers to be less trustworthy and reliable than physicians and health care providers [17]. However, they are still considered to be an important textual resource for health information [7], possibly because they are immediately available and because they use accessible language to deal with often complicated information.

The newspaper market in the United Kingdom is segmented demographically, socio-economically and politically. Each newspaper has specific appeal to sections of the population dependent on the content and editorial stance. Political leaning causes papers to be attractive to those with similar views. Physical paper size, previously, was an indication of the paper’s key market (broadsheet versus
but recently compact formats have been adopted by some broadsheet papers. The Audit Bureau of Circulation (ABC) classifies newspapers into three market segments: quality, populist and middle market publications [18]. The ABC classification of each newspaper (Table I) provides a proxy for socio-economic group and education level, which in turn provides a proxy for health status as lower socio-economic classes have demonstrated increased risk and incidences of CVD and T2DM than those in higher classes [19].

Given the potential significance of news media in informing the public on health-related issues, the objective of this research was to identify the extent to which newspapers currently inform people on the lifestyle choices that may prevent the early onset of NCDs. Individualistic approaches to disease prevention can be considered as one aspect that could result in behaviour change. Prior research on newspaper coverage of CVD and T2DM has shown that North American newspapers fail to include threat or efficacy categories of disease prevention information required to help inform and potentially motivate change [20].

The Marmot review indentified discrepancies in health equality across social and demographic indicators in England. These discrepancies are a matter of ‘life and death, of health and sickness, of wellbeing and misery’ [21]. The WHO recommends that social determinants be incorporated into government policy [22]. A need has been identified that social determinants of health should be communicated to the general public to build support for targeted government policy [23]. Research has shown that print media reporting has overlooked the importance of social determinants in disease prevention of NCDs [24]. The same study found that magazine articles promoted individual factors of disease prevention, such as consuming a healthy diet to prevent weight gain and the importance of increasing exercise levels but ignored social factors, such as income, education level and access to food. A more recent study found similar findings when looking at T2DM that newspapers focused on individualistic factors but failed to identify social determinants, which could influence policy changes [25].

A recent study examined a sample of 2490 Americans to elicit their response to one of four hypothetical news articles reporting information about T2DM. The information presented in the article was (i) identifying no cause and effect (control group), (ii) that genetic predisposition was associated with T2DM, (iii) behavioural and lifestyle factors were associated to T2DM or (iv) the social determinants of health relate to T2DM. It was found that those exposed to the article containing information about social determinants were more likely to acknowledge the existence of social factors in T2DM. However, the overall agreement level across the sample about the relevance of social determinants was poor. Differences were observed as a result of political identification—with those reporting an affiliation to the Republican party responding more negatively than those who had an affiliation to the Democratic party [23].

CVD and T2DM were selected in this research because there is clear evidence that preventative measures can be taken to reduce the risk of these diseases occurring. Research has also shown that CVD and T2DM are associated with each other: individuals who have been diagnosed with T2DM are twice as likely to suffer from a heart attack than those without T2DM [26].

This study has explored both the extent to which the diseases are mentioned, as well as the means by which the ‘story’ is communicated—i.e. through the reporting of scientific studies, symptoms and preventative measures in five leading UK national newspapers and their Sunday equivalents. In addition, an analysis was undertaken of the type of information provided to each socio-economic demographic to assess whether the portrayal of these diseases differs by target readership.

Methods

The chosen methodology was a content analysis. This technique has been used in social science inquiry to collate information and allows researchers to evaluate qualitative data in a quantitative manner. Content analysis was described by Krippendorff [27] as ‘a research technique for making replicable
Table I. Newspaper attributes [18] and variation in coverage of T2DM and CVD by newspaper characteristics

<table>
<thead>
<tr>
<th></th>
<th>The Daily Mail and The Mail on Sunday</th>
<th>The Times and The Sunday Times</th>
<th>The Mirror and The Sunday Mirror</th>
<th>The Daily Telegraph and The Sunday Telegraph</th>
<th>The Sun and The News of the World</th>
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<tr>
<td></td>
<td>Total readership of daily newspapers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2 308 325</td>
<td>622 186</td>
<td>1 483 749</td>
<td>874 124</td>
</tr>
<tr>
<td></td>
<td>Total readership of Sunday newspapers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2 213 112</td>
<td>1 206 517</td>
<td>1 338 822</td>
<td>625 549</td>
</tr>
<tr>
<td></td>
<td>ABC classification&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Middle market</td>
<td>Quality</td>
<td>Popular</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td>Political views&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Right wing</td>
<td>Centre-right</td>
<td>Left wing</td>
<td>Right wing</td>
</tr>
<tr>
<td></td>
<td>Predominant social class of the daily newspaper readers&lt;sup&gt;d&lt;/sup&gt;</td>
<td>ABC1 and C2DE almost evenly spread</td>
<td>ABC1</td>
<td>C2DE</td>
<td>ABC1</td>
</tr>
<tr>
<td>CVD Rank for quantity of articles (n)</td>
<td>1 (140)</td>
<td>2 (89)</td>
<td>4 (49)</td>
<td>5 (32)</td>
<td>3 (72)</td>
</tr>
<tr>
<td>CVD Rank for individual factors (% occurrence)</td>
<td>2 (35.9)</td>
<td>4 (34.7)</td>
<td>4 (34.7)</td>
<td>1 (45.1)</td>
<td>3 (35.5)</td>
</tr>
<tr>
<td>CVD Rank for social determinants (% occurrence)</td>
<td>2 (2.7)</td>
<td>1 (3.1)</td>
<td>3 (1.8)</td>
<td>5 (0.5)</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>T2DM Rank for quantity of articles (n)</td>
<td>1 (15)</td>
<td>3 (7)</td>
<td>5 (3)</td>
<td>2 (8)</td>
<td>3 (7)</td>
</tr>
<tr>
<td>T2DM Rank for individual factors (% occurrence)</td>
<td>1 (50.5)</td>
<td>2 (44.9)</td>
<td>3 (42.9)</td>
<td>4 (37.5)</td>
<td>5 (30.6)</td>
</tr>
<tr>
<td>T2DM Rank for social determinants (% occurrence)</td>
<td>1 (5.6)</td>
<td>2 (4.4)</td>
<td>4 (0)</td>
<td>4 (0)</td>
<td>3 (2.2)</td>
</tr>
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</table>

<sup>a</sup>Based on data from March 2008 from www.abc.org.uk.
<sup>b</sup>Based on information from www.abc.org.uk.
<sup>c</sup>Based on information from www.britishnewspapers.co.uk.
<sup>d</sup>Based on ABC classification of popular, middle market and quality newspapers from 2008 from www.abc.org.uk.
and valid inferences from texts (or other meaningful matter) to the contexts of their use'. The data is considered objectively and systematically categorized for analysis to generate new insights from existing data [27].

The research sample was drawn from five leading UK National newspapers and their Sunday equivalents. The sampled newspapers represent approximately 85% of the daily UK newspaper market and 74% of the Sunday newspaper market [28]. Quality newspapers included The Times, The Sunday Times, The Daily Telegraph and The Sunday Telegraph. Middle Market newspapers included The Daily Mail and The Mail on Sunday. The popular papers included The Mirror, The Sunday Mirror, The Sun and The News of The World. The sample was drawn from articles appearing between 1 January 2008 and 30 March 2008. During the 3-month period, no major health initiatives were launched. Newspapers were selected to represent the three ABC classifications identified above and a range of political values. The populist papers (The Sun and The Mirror) have a combined readership of 4.3 million; the quality papers (The Times and The Daily Telegraph) have a combined readership of 1.4 million and The Mail (middle market) reaches 2.1 million readers [18], which can be seen in Table I.

To obtain a representative sample over the study period, a key word search of ‘Cardiovascular Disease’, ‘Heart Health’, ‘Heart Disease’ and ‘Type 2 Diabetes’ was conducted using the LexisNexis search engine. Only articles containing these exact words were included in the analysis.

Articles were excluded if they were a duplicate, only had a passing reference to the search terms (where there was no text that could be coded into the coverage variables), Scottish or Irish editions (due to a large amount of duplication), which would distort the analysis. Articles referencing congenital heart defects for CVD were excluded as the prognosis is unchangeable by behaviour modification. All articles were analysed using the qualitative software package Nvivo 8. Chi-square statistics were computed using SPSS version 16.

The recording/coding units for the content analysis were defined prior to data collection by the author and based upon guidelines produced by the National Institute of Health and Clinical Excellence (NICE) and the WHO [1, 19, 29–33]. These organizations provide accurate guidelines on both diagnosis and treatment of T2DM and CVD to the public and to health care professionals. The content of each article was coded into seven different binary variables for CVD and eight different binary variables for T2DM if they were found in the article. The coding used included ‘signs and symptoms’ (external and internal changes), ‘complications and risk factors’ (likely or unlikely complications associated with the disease and behaviour or genetic factors that increase risk), ‘prevention’ (lifestyle factors that could be changed to prevent disease onset), ‘treatment’ (mention of new or existing ways to treat the disease), ‘science articles’ (articles based on scientific research), ‘severity’ (disease can result in reducing quality of life and ultimately death) and ‘diagnosis’ (reporting of ways to diagnose the disease). The prevention variable comprised of several subcategories. For the purposes of this research, only the WHO-recognized prevention variables were included. Prevention subcategories consisted of ‘healthy diet’ (discussion of alternative foods and reducing dietary intake), ‘active lifestyle’ (any suggestion to increase physical activity or mention of UK exercise target of five 30-min sessions), ‘no tobacco’ (suggestion of smoking cessation), ‘moderate alcohol’ (indication of safe levels of alcohol intake) and ‘healthy weight’ (importance of maintaining or achieving a healthy weight). Social determinants that influence disease prevention were identified based on the study conducted by Clarke and van Amerom [24]; in total, 13 variables (income, education, ethnicity, minority, early life experience, employment, working conditions, food access, housing, unemployment, employment security, marital status and family status) were identified and included in the analysis.

Inter-coder reliability between three observers was calculated using the Kalpha macro version 2.1. A value of >0.8 identifies good reliability between coders and suggests that these results would be replicated given a similar sample and a value of 0.667–0.8 is considered grounds for tentative
agreement [34]. The second and third coders were academic staff members who had no specialist knowledge regarding CVD or T2DM. The overall Krippendorff’s alpha for CVD and T2DM individual factors was calculated as 0.8390 (CVD = 0.9185 (CVD Kalpha for complications and risk factors = 0.8254, severity = 0.9292, ‘diagnosis’ = 0.7404, ‘science article’ = 1.0, signs and symptoms = 0.7896, prevention = 0.8952 and ‘treatment’ = 0.7527) and T2DM = 0.8505 (T2DM Kalpha for complications and risk factors = 0.8352, severity = 0.7225, ‘diagnosis’ = 1.0, ‘science article’ = 1.0, signs and symptoms = 1.0, prevention = 0.7212 and ‘treatment’ = 1.0]). Kalpha for the social determinants was 1.0 for both CVD and T2DM.

Results


Table I presents newspaper attributes and the results from this study. The top half of Table I combines readership figures, editorial stance, political views and social class of the newspapers readers. The market research society identifies different social class groups [35]. The ABC1 classification represents upper middle class (higher managerial) through to lower middle class (administrators). The C2DE classification represents skilled working class (skilled manual workers) through to those on government benefits, students and casual workers.

The second half of Table I shows the variation in newspaper coverage of T2DM and CVD. There was a large disparity in the number of articles mentioning CVD between the newspapers. The Daily Mail and The Mail on Sunday reported on the disease nearly twice as much (140 articles) as the next most frequent newspaper (The Times and The Sunday Times returning 89 articles). The Telegraph and The Sunday Telegraph (32 articles) and The Mirror and The Sunday Mirror (49 articles) provided the lowest frequency of articles.

There was a marked disparity in the number of articles in the newspapers relating to T2DM. Most articles appeared in The Daily Mail and The Mail on Sunday who published 15 articles during the survey period in comparison to The Mirror and The Sunday Mirror (three) who had the least number of articles. In comparison to CVD, T2DM was reported less frequently (40 T2DM articles versus 382 CVD articles).

Of the 382 CVD articles, only eight articles (2%) mentioned that T2DM was a risk factor for CVD. A total of 7 of 40 (18%) T2DM articles mentioned that there is an increased risk of CVD from having diabetes. Reporting of social determinants was very low for both diseases across the newspapers returning less than 6% average occurrence. No statistical difference was found between the newspapers, when a chi-square test was conducted and the results are not discussed further.

CVD reporting

Table II provides the absolute occurrence count, the percentage occurrence, the overall variable occurrence of CVD coverage for each newspaper and chi-square test of association. The proportion of variable occurrence was calculated as the percentage occurrence of that variable in all articles for that newspaper. The overall variable occurrence of CVD coverage was calculated by averaging all the CVD variables for each newspaper.

The chi-square test showed only three significant results between CVD variable reporting and newspapers. Science articles had the greatest significant P value (P = 0.002), showing that across newspapers, the level of articles containing science was significantly different. The highest proportion of articles based on science were found in The Daily
Table II. The absolute frequency of articles (n) and the average occurrence (%) of disease variables important to adequately represent CVD and Type 2 diabetes identified per newspaper during content analysis

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<tbody>
<tr>
<td>CVD</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>$\chi^2$ (P value)</td>
</tr>
<tr>
<td>Signs and symptoms</td>
<td>13 9</td>
<td>4 4</td>
<td>3 6</td>
<td>5 16</td>
<td>6 8</td>
<td>9</td>
<td>4.5 (0.342)</td>
</tr>
<tr>
<td>Complication and risk factors</td>
<td>102 73</td>
<td>66 74</td>
<td>42 86</td>
<td>30 94</td>
<td>56 78</td>
<td>81</td>
<td>9.0 (0.060*)</td>
</tr>
<tr>
<td>Prevention</td>
<td>89 64</td>
<td>44 49</td>
<td>32 65</td>
<td>17 53</td>
<td>43 60</td>
<td>58</td>
<td>5.8 (0.211)</td>
</tr>
<tr>
<td>Treatment</td>
<td>20 14</td>
<td>13 15</td>
<td>7 14</td>
<td>5 16</td>
<td>11 15</td>
<td>15</td>
<td>0.1 (0.999)</td>
</tr>
<tr>
<td>Science articles</td>
<td>75 54</td>
<td>50 56</td>
<td>15 31</td>
<td>24 75</td>
<td>38 53</td>
<td>54</td>
<td>16.5 (0.002***)</td>
</tr>
<tr>
<td>Severity</td>
<td>32 23</td>
<td>21 24</td>
<td>14 29</td>
<td>16 50</td>
<td>18 25</td>
<td>30</td>
<td>10.6 (0.031***)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>21 15</td>
<td>18 20</td>
<td>6 12</td>
<td>4 13</td>
<td>7 10</td>
<td>14</td>
<td>4.0 (0.411)</td>
</tr>
<tr>
<td>Overall variable occurrence</td>
<td>35.9 34.7</td>
<td>34.7 34.7</td>
<td>34.7 34.7</td>
<td>45.1 35.5</td>
<td>45.1 35.5</td>
<td>35.5</td>
<td>35.5 (0.855)</td>
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<tr>
<td>T2DM</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>$\chi^2$ (P value)</td>
</tr>
<tr>
<td>Signs and symptoms</td>
<td>2 13</td>
<td>4 57</td>
<td>0 0</td>
<td>0 0</td>
<td>1 14</td>
<td>17</td>
<td>10.2 (0.037)</td>
</tr>
<tr>
<td>Complication and risk factors</td>
<td>12 80</td>
<td>6 86</td>
<td>3 100</td>
<td>6 75</td>
<td>5 71</td>
<td>82</td>
<td>1.3 (0.855)</td>
</tr>
<tr>
<td>Prevention</td>
<td>9 60</td>
<td>5 71</td>
<td>1 33</td>
<td>2 25</td>
<td>4 57</td>
<td>49</td>
<td>4.3 (0.370)</td>
</tr>
<tr>
<td>Treatment</td>
<td>10 67</td>
<td>4 57</td>
<td>1 33</td>
<td>4 50</td>
<td>1 14</td>
<td>44</td>
<td>5.7 (0.222)</td>
</tr>
<tr>
<td>Science articles</td>
<td>11 73</td>
<td>2 29</td>
<td>3 100</td>
<td>7 88</td>
<td>3 43</td>
<td>66</td>
<td>9.4 (0.051*)</td>
</tr>
<tr>
<td>Severity</td>
<td>7 47</td>
<td>1 14</td>
<td>1 33</td>
<td>2 25</td>
<td>1 14</td>
<td>27</td>
<td>3.7 (0.442)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>2 13</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>3</td>
<td>3.5 (0.477)</td>
</tr>
<tr>
<td>Overall variable occurrence</td>
<td>50.5 44.9</td>
<td>42.9 37.5</td>
<td>37.5 30.6</td>
<td>37.5 30.6</td>
<td>37.5 30.6</td>
<td>30.6</td>
<td>30.6 (0.855)</td>
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*Significant to the 0.10, **significant to the 0.05 and ***significant to the 0.01 level.
Telegraph and The Sunday Telegraph (75%), while The Mirror and The Sunday Mirror had the lowest percentage of articles (31%). The second significant result was found for severity (P = 0.031); The Daily Telegraph and The Sunday Telegraph contained the highest percentage of articles containing the variable at 50% and the lowest was found in The Daily Mail and The Mail on Sunday, only 23% of their articles related to the variable. The third significant result was found for complications and risk factors (P = 0.060), with The Daily Telegraph and Sunday Telegraph including this variable in 94% of articles and The Daily Mail and The Mail on Sunday only including it in 73% of articles.

The variable prevention for CVD was averaged over all articles for each newspaper and shown in Table III. The most frequently reported prevention variables were healthy diet (ranging between 45% of articles in The Mirror and The Sunday Mirror to 13% in The Times and The Sunday Times and an average of 27% for all newspapers in the sample) and an active lifestyle (from 27% for The Mirror and The Sunday Mirror to 6% for The Daily Telegraph and The Sunday Telegraph, with an average of 15% for all papers). ‘Minimizing tobacco’ was the least reported variable occurring in 6% of newspaper articles. No single prevention variable occurred in more than 30% of the articles sampled. The chi-square revealed one statistically significant result at the 0.1% level for healthy diet.

The average occurrence of disease variables for CVD was lower for the Sunday newspapers than their respective weekday counterparts. Similarities can be seen in the quantity of articles; The Mail on Sunday had the highest number of articles and The Sunday Mirror and Sunday Telegraph had the least number of articles. Variable occurrence per article per newspaper was lower than in the weekday editions with only one variable—complications and risk factors—for The Sunday Mirror at 100%.

A keyword search was conducted for ‘diabetes’ within the CVD, heart health and heart disease articles, which returned 109 articles. From those articles, only eight articles made the link between diabetes and the increased risk of suffering from CVD.

T2DM reporting
Table II also provides the results for T2DM variables. The Daily Mail and The Mail on Sunday were the only newspapers to report all T2DM variables. The chi-square test identified several significant associations between the reporting of T2DM variables and the newspapers. Signs and symptoms showed a significant statistical difference (P = 0.037). The Times and The Sunday Times reported signs and symptoms in 57% of their articles, while the lowest variable occurrence was found in The Mirror, The Sunday Mirror, The Daily Telegraph and The Sunday Telegraph with no articles containing the variable. Science articles also showed a significant difference (P = 0.051), The Mirror and The Sunday Mirror with a percentage occurrence of 100% and the lowest paper was The Times and The Sunday Times with 29%.

WHO-defined prevention subcategories occurrences were averaged as a proportion over all articles for each newspaper (Table III). The Daily Mail and The Mail on Sunday were the only newspapers to report all variables at least once (overall WHO prevention occurrence 16%), covering factors such as minimizing alcohol and ‘tobacco consumption’. The most frequently reported variables were healthy diet (22% averaged over all newspapers) and an active lifestyle (19%). No tobacco and moderate alcohol were reported in less than 2% of articles. The Mirror and The Sunday Mirror failed to report any prevention information in the sampled articles. The chi-square test revealed no statistically significant results at the 10% level.

Discussion
Main finding of this study
A marked variation in newspaper reporting of CVD and T2DM was observed, although only three CVD variables showed a significant difference. For CVD, The Daily Telegraph and The Sunday Telegraph provided the most variables and The Times, The Sunday Times, The Mirror and The Sunday Mirror the least. However, for T2DM, The Daily Telegraph and The Sunday Telegraph provided the
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<tbody>
<tr>
<td>Healthy diet</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>CVD</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Active lifestyle</td>
<td>40</td>
<td>29</td>
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*Significant to the 0.10, **significant to the 0.05 and ***significant to the 0.01 level.
second lowest and The Times and The Sunday Times the second highest source of variables. Journalists make assumptions on the information their readers want and the pre-existing knowledge people already have. This may explain the differences observed between the levels of information provided by different newspapers. As readers mature from the 15–34 age bracket into the 35–54 age range, they shift from populist to middle market newspapers; quality newspaper readership is evenly divided across age [36]. The same data showed that lower socio-economic classes (C2DE) are more likely to read populist newspapers (55%) in comparison to quality newspapers (8%), while higher social classes (ABC1) are almost evenly spread among quality middle market and populist newspapers. Social class and age are not only linked to a person’s preferred category of newspaper but also appear to be associated with the prevalence of health inequalities. CVD and T2DM have been shown to have more of a detrimental impact upon the lower socio-economic classes, who are currently not being catered for by the newspapers they choose to read [37, 38].

Table I showed considerable consistency between the extent of reporting of the two diseases, with very similar rank orders for CVD and T2DM for the five newspapers. The Daily Mail and The Mail on Sunday (middle market) were clearly pre-eminent in their coverage of health issues. The populist newspapers who, in combination, reach approximately 4.5 million readers per day (the largest coverage), contained the least coverage of CVD and T2DM overall. When the articles where explored in more detail and each of the variables were considered in turn, the results indicated that The Sun and The News of the World had been relatively active in identifying prevention variables. Due to the data showing differences in individual variable occurrence (where some percentages of variable occurrence were higher than others), these newspapers still miss opportunities to provide information on CVD and T2DM, particularly as the demographic for populist newspapers may be less likely to seek out such information elsewhere.

There were nine times as many articles about CVD in the sample as about T2DM. A possible reason for this disparity is the prevalent perception of CVD as an ‘immediate killer’ and more severe than T2DM. Information pertaining to CVD from health agencies, research institutions and scientific journals maybe more effectively communicated to journalists in comparison to T2DM. Further research could be conducted to evaluate the relative effectiveness of communication of differing sources of disease information. Analysis of the EurekAlert! press release aggregation website shows that during the survey period, 231 press releases were made about CVD, while only 86 were made about T2DM, this might be further explanation for the imbalance in the discrepancy in article counts [39]. For example, on the 7 March 2008, Elsevier issued a press release about a study that featured in the American Journal of Medicine, this press release was picked up by The Times and The Mirror who both featured it the next day.

It was observed that a total of 15 articles (4%) mentioned that T2DM increases the risk of CVD; the small proportion of articles making this link fails to help increase awareness among the general population. Those already affected with T2DM might be aware of the increased CVD risk (NICE guidelines recommend that those with T2DM should be treated for CVD [40]); however, newspapers could also help prevent complications by reporting the severity of T2DM and CVD and their links. The preventative measures for most NCDs (including T2DM and CVD) are similar and were frequently under-reported by the sampled newspaper articles. Prior research has shown that there has been an increasing trend of reporting CVD risk along with T2DM in Canadian newspapers [41].

Social determinants were infrequently reported by the sampled newspaper articles supporting previous research conducted in American newspapers and Canadian magazines [24, 25]. This shows a further area where newspapers could increase reporting to highlight the difficulties segments of society can be faced with when seeking positive health outcomes. This style of reporting could help to influence public policy and increase the social
responsibility of the print media. However, there are challenges associated with communicating social determinants of health; when newspapers and print media do report social determinants of health, they need to be careful to avoid negative stereotypes, counterproductive emotional responses or distract from the underlying message [42].

Newspapers generally reported a lack of prevention variables. ‘Consumption of alcohol’ and no tobacco were observed to be the least reported variables for both CVD and T2DM. Journalists may assume prior knowledge about the detrimental effects of smoking and excessive alcohol consumption or be concerned that the information is not palatable to readers, resulting in cognitive dissonance and a lack of attention to the article. However, recent advertising campaigns (during Christmas 2007/2008) about binge drinking (Think!) and smoking (Getting off Cigarettes) mean that these issues may have been more apparent to the reader. Healthy diet was the most widely reported variable, possibly because dietary advice provides help and guidance of a positive nature, helping to sell newspapers.

What this study adds
This study identified, within the remit of the sample, the low coverage of CVD and T2DM (in terms of number of articles and social determinants). The number of sampled CVD articles was nine times higher than the number of T2DM articles, possibly as a result of the lower number of T2DM scientific-related press releases.

Readers of the popular press are predominantly from lower social classes (C2DE) with more marked health inequalities than the higher social classes (ABC1). Those who are classified as being from the C2DE bracket are more at risk of developing CVD and T2DM [37, 38]. This population segment is therefore more in need of information about these diseases but is not being catered to through the newspapers they choose to read.

This study suggests that newspapers appear to miss potential for societal advancement by their relatively infrequent reporting of health information. This report opens the debate on the purpose of news media—whether it is for information and guidance or for leisure and entertainment. As part of a trend towards social responsibility in organizations, it may be possible for the news media to look to accurate, reliable and effective reporting of health issues, such as how to prevent CVD and T2DM, as a potential opportunity for societal gain. Health professionals may want to consider engaging directly not only with the public but also with the media to ensure that newspaper coverage accurately reflects the nation’s health needs. The use of news media should not, however, be seen as an alternative to other forms of communication of current government policy but as a means to enhance or further disseminate their desired message. With more information, newspapers may feel that these issues are sufficiently newsworthy or believe that they are important for social responsibility reasons.

Limitations of this study
There are two main limitations of this study: firstly the duration of the sampling period covered. The sampling period was deliberately chosen to not overlap with any major UK public health intervention and therefore to provide a baseline of CVD and T2DM reporting. It is not possible to say if the baseline reported in this article is actually representative over a wider period of time.

An extensive variety of search terms for CVD and T2DM were used to collect articles; however, this does not exclude the possibility that articles covering CVD or T2DM were not collected due to the use of colloquialisms within the text. It is not possible to be definitive in stating that all relevant articles were analysed.

The inter-coder reliability values indicate that certain variables were easier to code than others. In the original coding, a variable for physiology of T2DM articles was included; however, the Kalpha was very poor (<0.3) and therefore the variable was removed from the analysis. T2DM variables Kalpha for severity was calculated at 0.7225 and prevention was calculated at 0.7212, which means that only tentative conclusions can be drawn for these variables.

This study has provided a starting point for further research and evaluation. An aspiration could
be for government and media to work together to ensure consistency in public health education and providing pertinent information to the public. Governmental media sources could help to supplement newspaper articles to improve the consistency of information provision to the population. This would need to be handled sensitivity to ensure that the freedom of the press is not affected.

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**References**


