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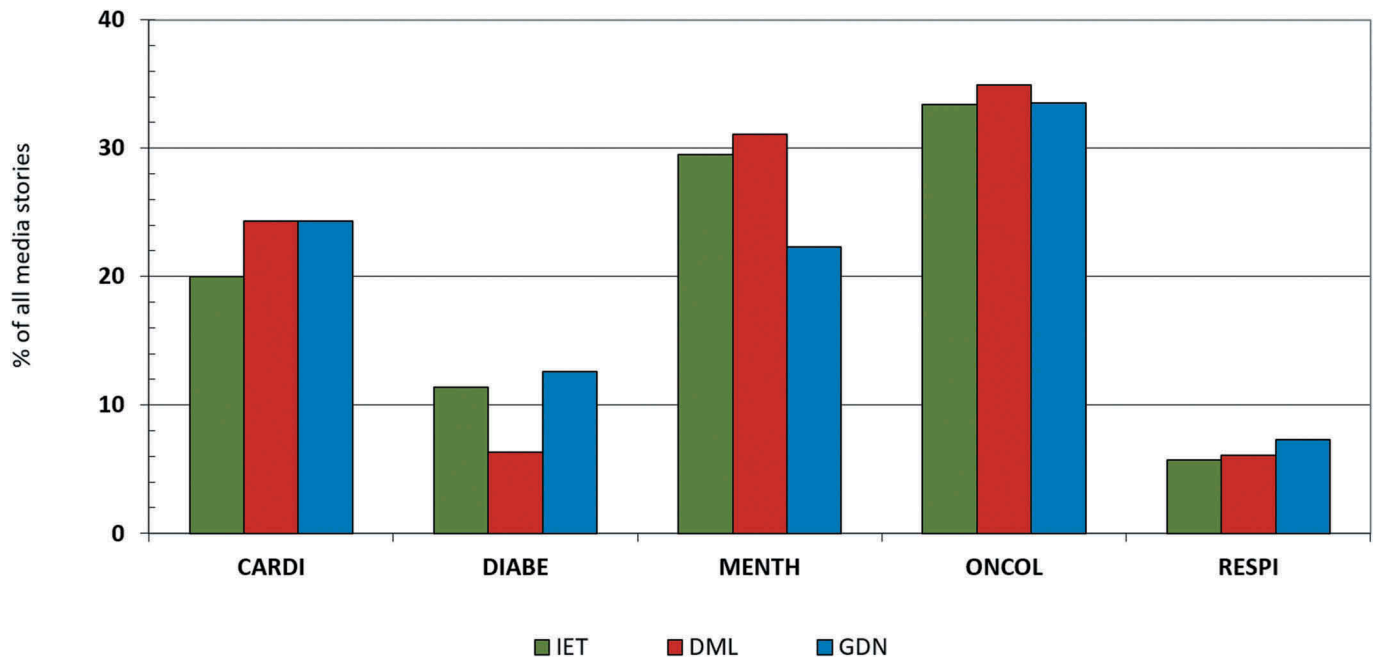
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PUBLIC HEALTH & PRIMARY CARE | RESEARCH ARTICLE

An assessment of the coverage of non-communicable disease research reported in British and Irish newspapers, 2002-13

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Abstract: Background: The reporting of medical research in the mass media is often the only way for the general public to learn about it, as most people do not read, nor have access to, scientific papers. Aims: We wished to map non-communicable disease (NCDs) research stories in two UK newspapers, the *Daily Mail* and *The Guardian*, and an Irish newspaper, the *Irish Times*, in 2002–13. Methodology: We identified relevant stories by means of the Factiva database, and obtained details of the cited research papers from the Web of Science. We compared coverage of research on five NCDs with the disease burden, and with the amount of research, in the two countries. We also analysed the sex distribution of the journalists, the researchers whose work was cited and any commentators mentioned in the stories. Results: There were 3921 stories in total (1990 in the *Daily Mail*, 1127 in the *Irish Times*, and 804 in *The Guardian*). Cancer and mental health disorders research attracted most attention. The other NCDs were cardiovascular disease & stroke, diabetes, and respiratory diseases. The stories tended to focus on epidemiological research, and means to reduce the risk of disease, rather than treatment. Both countries over-cited their own research, particularly Ireland. Conclusions: Coverage of the five NCDs tended to mirror the amounts and changes in the disease burden, both in time and between the two countries, notably for dementia and depression. Male researchers and commentators received more attention than females, and so reinforced existing gender stereotypes.

ABOUT THE AUTHOR

The group uses quantitative methods and indicators to gauge whether the output of medical research is appropriate in scale and in distribution, at the national, European and global level. Dr Grant Lewison has been working in the field of bibliometrics for the past 34 years. Elena has been collaborating with Grant for the past six years and the work of the group grew bigger with the bibliometric evaluation of research impact. This includes the impact of the research on government policy, clinical practice guidelines, and public health communication through the mass media.

Elena Pallari & Grant Lewison

PUBLIC INTEREST STATEMENT

Non-communicable diseases include cardiovascular disease & stroke, cancer, diabetes, mental health disorders, and respiratory diseases. In this study we examined the coverage of research on these five non-communicable diseases in three newspapers. Two were UK daily newspapers: Daily Mail and The Guardian, and the third an Irish one: the IrishTimes in the 12 years, between 2002 to 2013. We found that the coverage paralleled the changes in the burden of disease in the UK and Ireland, notably the reduction in that from cardiovascular disease & stroke that has taken place. Most stories were about the causes of disease and how to prevent them, rather than means of treatment. Most of the researchers were male whose work was reported. The same was found for the experts who were invited to comment on the significance of the results.

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1. Introduction

The UK and Ireland share many characteristics, including publicly-funded health services (the UK National Health Service (NHS) and the Irish Health Service Executive (HSE)). The latter replaced a network of local service providers in 2005 and is due to be replaced by them. Both services have suffered from a shortage of funding to provide for a growing demand for care as the two populations age (O'Regan & Sheahan, 2008; RTÉ Newsroom RTÉ, 2015; Sawe & Donnelly, 2013; Watt et al., 2013).

Although there are many similarities between the UK and Ireland, in terms of the genetics of the populations, lifestyle, and diet, there are some differences between them in terms of the burden of disease from which they each suffer. This is normally expressed as Disability-Adjusted Life Years (DALYs), which are the sum of Years of Lost Life (YLLs) compared with the life expectancy at age of death in Japan (currently the country with the highest life expectancy) plus the Years Living with a Disability (YLDs). These are weighted according to the amount of pain and suffering from 0 = perfect health to 1 = death. In Table 1, below, we present the percentages of all DALYs from five non-communicable diseases (NCDs) for 2000 and 2015, taken from data published by the World Health Organization (WHO).

The pattern of disease is fairly similar between the two countries, but the UK suffers more from cancer, and Ireland more from diabetes and mental health disorders. The latter has increased substantially between 2000 and 2015, whereas there have been big reductions in both countries in the burden from cardiovascular disease and stroke, which in 2000 was the most burdensome but in 2015 had dropped to third place. Diabetes still causes a relatively minor burden, but it has increased noticeably in Ireland.

We wished to examine two of the disease areas in more detail, cancer and mental health disorders, and the corresponding percentages of the overall disease burden are listed in Table 2 for six cancer sites and six mental health disorders, ranked by their burdens in the UK in 2015.

Of the different cancers, lung cancer is by far the most burdensome in both countries. The main changes have been the increase in prostate cancer, particularly in Ireland, and of pancreatic cancer in the UK. Among the mental health disorders, the increase in burden from Alzheimer's and other dementias is very striking, particularly in the UK. Consequently, most other mental health disorders have reduced as a percentage of the total. Ireland appears to suffer much more from anxiety & other phobias, and perhaps as a consequence more from suicide & self harm, than does the UK.

There are many papers that describe how medical research is portrayed in the mass media, and the number is increasing, see Figure 1. Thus, half the output of papers between 1990 and the present took place in the last eight years. It appears to be largely an Anglophone-country activity, and three quarters of these papers came from these countries. Although some studies covered media from different countries and/or of different types (Cacciatore et al., 2012; Clarke, 2011; Fanelli, 2013; Holtzman et al., 2005; Lai & Lane, 2009; McWhirter & Hoffman-Goetz, 2015; Pallari et al., 2017; De Semir et al., 1998), most of the literature describes stories in newspapers in a single country, for example, the UK (Bartlett et al., 2002), Trinidad & Tobago (Nichols & Chase, 2005), Japan (Akamatsu et al., 2009), Brazil (Teixeira et al., 2012), the USA (Strekalova, 2015) and Sweden (Bogren, 2017). Moreover, they often focus on a particular medical subject area such as anti-hypertensive drugs (Brunt et al., 2003), cancer (Jensen, 2008), diabetes (Akamatsu et al., 2009), arthritis (Hanson et al., 2017) or the effects of alcohol (Bogren, 2017).

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Table 1. The burden of disease, as a percentage of all DALYs, from five non-communicable diseases in the United Kingdom (UK) and Ireland (IE), 2000 and 2015, and the ratio between them

Disease or disorder	Code	2000		2015		Ratio, 2015/2000	
		UK	IE	UK	IE	UK	IE
Malignant neoplasms	ONCOL	19.5	18.1	21.0	19.6	1.08	1.08
Mental health disorders	MENTH	10.3	13.1	15.8	17.6	1.53	1.34
Cardiovascular disease & stroke	CARDI	23.8	21.8	15.5	14.8	0.65	0.68
Respiratory diseases	RESPI	6.5	6.4	7.2	6.0	1.12	0.94
Diabetes mellitus	DIABE	1.5	1.7	1.6	2.3	1.07	1.37

Table 2. The burden of disease, as a percentage of all DALYs from cancer and from mental health disorders, from six manifestations of cancer and six mental health disorders in the United Kingdom (UK) and Ireland (IE), 2000 and 2015, and the ratio between them

Disease or disorder	Code	2000		2015		Ratio, 2015/2000	
		UK	IE	UK	IE	UK	IE
Cancer sites							
Lung cancer	LUN	21.6	20.1	21.1	19.9	0.98	0.99
Colorectal cancer	COL	11.6	11.6	10.6	11.6	0.92	1.00
Breast cancer	MAM	11.6	11.1	9.7	10.6	0.84	0.95
Prostate cancer	PRO	5.8	4.9	6.2	6.2	1.07	1.26
Lymphomas, multiple myeloma	LYM	5.7	5.4	5.4	5.2	0.93	0.96
Pancreatic cancer	PAN	4.3	5.4	5.1	5.1	1.19	0.95
Mental health disorders							
Alzheimer's & other dementias	ALZ	16.4	10.5	34.7	17.9	2.11	1.69
Unipolar depression	DEP	21.9	22.2	17.3	20.4	0.79	0.92
Drug addiction	ADD	11.2	9.4	10.9	11.5	0.97	1.23
Suicide and self harm	SUI	13.5	19.1	9.3	14.7	0.69	0.77
Anxiety & other phobias	ANX	11.9	15.4	9.0	14.3	0.75	0.93
Alcohol misuse	ALC	5.3	6.4	4.0	4.8	0.76	0.75

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Figure 1. Numbers of papers in SCI that treat of newspaper stories of medical research.
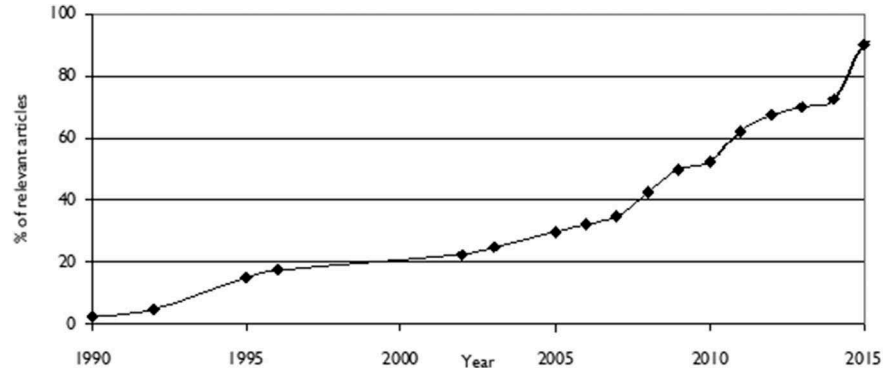
2. Methodology

Our intention in this paper was to compare the press coverage of medical research in the newspapers of two neighbouring Anglophone countries, the United Kingdom (UK) and Ireland (IE), in order to see whether their coverage reflected the disease burden from different diseases, or the amount of research on them. We covered a 12-year period, 2002–13, so as to show if the coverage varied with time, and three prominent newspapers, the *Daily Mail* (DML) and *The Guardian* (GDN) in the UK, and the *Irish Times* in Ireland (IET). DML is a popular tabloid, with a right-wing political slant, and an extensive coverage of health matters. GDN is a left of centre newspaper in Berliner format. IET is a broadsheet, originally with a British protestant point of view, but now describing itself as "liberal and progressive". As a subsidiary objective, we decided to check if there was a difference between the papers in the gender balance of their medical research journalists, of the researchers whose work they wrote about, and of the commentators they quoted in order to put the new research in perspective.

2.1. Study rationale

The work on the two British newspapers was carried out as part of a major study for the European Commission (Mapping_NCD) in 2014–15. This examined the outputs of research papers, and their impact, from European Union countries plus Iceland, Norway and Switzerland (EUR31) in the five non-communicable diseases or disorders listed in Table 1:

3. Study objectives

We made four main comparisons in order to determine whether the coverage of medical research news varied:

- between a politically right-wing and populist newspaper (DML) and a politically left-wing and intellectual one (GDN);
- between two UK newspapers and one Irish one (IET), to see if the health problems and their presentation were similar or different in the two countries, whether they reflected the relative disease burdens, and changes in time;
- between the five different non-communicable diseases; and
- between the relative coverage of men and women among the research scientists and commentators named in the stories, and the journalists who wrote them.

For each of these comparisons, the null hypothesis was that there would be no difference in coverage or form of presentation, and that men and women would be treated equally.

4. Data sources

For the stories in the *Daily Mail*, we searched its own archive, while for the other two newspapers, their archive was limited to a specific timeframe, so we used the Factiva database © Dow Jones to

access all records between 2002 and 2013. The search strategies used included the names of the relevant NCDs:

> *For CARDI: (heart OR stroke OR blood pressure OR hypertension)*

> *For DIABE: diabet**

> *For MENTH: (addict* OR ADHD OR alcoholi* OR Alzheimer's OR anorexia OR anxiety OR bipolar OR bulimia OR dementia OR depression OR hyperactivity OR schizophrenia OR self-harm* OR suicide*)*

> *For ONCOL: (cancer OR leukaemi* OR melanoma* OR lymphoma*)*

> *For RESPI: (asthma OR COPD OR chronic obstructive pulmonary disease OR allergic rhinitis OR cystic fibrosis OR emphysema)*

combined with a set of terms indicative of research:

> *(research* OR study OR scientist* OR expert*).*

These search strategies were used to search for relevant stories. However, they generated a large number of false positives, which were eliminated by one of us as we read the individual stories. They were retained only if they clearly cited a research paper in a peer-reviewed journal that was covered in the Web of Science (WoS © Clarivate Analytics). Some of the stories covered more than one of the five NCDs, so there may be some double-counting in the data given below.

5. Data collection

Details of the newspaper stories were entered into an MS Excel spreadsheet; they included the source, date, headline and a brief synopsis, the names and job titles of the journalists, codes to describe the NCD and subject areas within it, and information about the paper to facilitate its identification in the WoS, including any named researchers and their institutions. Our researcher team also noted the details of any external commentators who put the cited research in context, with their names and organisations. The latter were coded to show their sector (*e.g.*, government, private-non-profit, industry) and country. We divided the private-non-profit organisations into five: collecting charities, CH (whose main business was the financing or conduct of research); endowed foundations, FO; hospital trustees, HT (who could use various local funds to support research); academic bodies, AC (many of which would both appeal for money and use their endowments for research); and other non-profit organisations, NP. The latter included professional associations, trade associations and lobbying groups, patient support organisations, and research institutes with a variety of sources of support.

Details of the cited papers were then downloaded from the WoS to a series of numbered text files, including the title, authors' names, addresses, and the bibliographic source. They were then individually matched to the citing story and copied across to the relevant row of the spreadsheet. The WoS was used as a source for the cited papers as we have an extensive set of Visual Basic Application (VBA) programs (written by Philip Roe of Evaluametrics Ltd) for the conversion of the text files to MS Excel, and for their subsequent analysis. It also provided coverage of almost all of the cited papers if they were in peer-reviewed journals.

6. Data analysis

The details of the cited research papers in the three spreadsheets (which were combined into one for analysis purposes) were then analysed by a series of VBA programs to provide the following data:

- the type of research (*e.g.*, genetics, epidemiology, or means of treatment), based on sub-filters that contained specific title words and journal name strings;
- which disease area(s) were covered in the paper (*e.g.*, anatomical site for cancer, individual mental health disorder), again based on sub-filters;
- the countries of authorship, on a fractional count basis.

The first two classifications were also provided by the researchers who had read the original stories, but on a slightly different system.

Comparisons were also made with the burden of disease measured as Disability-Adjusted Life Years (DALYs), as given by the World Health Organization (World Health Organization WHO, 2016). Data were taken from the years 2000 and 2015 (see Tables 1 and 2), and each disease or disorder was calculated as a percentage of the total burden for that year in the UK and in Ireland. For four of the NCDs, the WHO classification was used, but for MENTH we included Alzheimer's disease and other dementias, and self-harm (which includes suicide), as these are really manifestations of mental disorder, but excluded some intractable disorders for which there is no current treatment such as autism and Asperger syndrome, and idiopathic intellectual disabilities. The purpose was to see if newspaper coverage in the two countries reflected their relative disease burdens.

We listed the names of the journalists who wrote the stories, the scientists whose work was cited, and the commentators, and then determined their distribution by sex on the basis of their given names (which were almost always provided, rather than simply initials). Many of these given names (*e.g.*, Michael, Susan) could easily be sexed, but a large number, particularly of the scientists, were from non-Anglophone countries. Most of these could be sexed with the aid of the website, baby name guesser (Peters). "*The program uses Google's database to analyze common patterns involving that first name. It then determines from popular usage on the web whether the name is more commonly for a male or a female.*" Although for most names there was a clear distinction between "*boy names and girl names*", some were almost androgynous, and there may have been some misattribution in individual cases. However, although we were sometimes able to match the names of scientists with given names to those with only initials, there remained a substantial proportion (about one third for GDN and IET, but only 22% for DML) where we were unable to determine their given names, and hence their sex.

Statistical comparisons between the numbers of stories expected in different categories, or in different media, were made on the basis of extrinsic factors such as the disease burden or the relevant research outputs in the UK or Ireland, or intrinsic ones such as the coverage in the other media. The analyses were all based on the Poisson distribution with one degree of freedom, and statistical significance was determined by the probability being less than 5%.

7. Results

Altogether, there were a total of 3921 stories and cited papers, and their partition between the five NCDs is shown in Figure 2. The comparison of the amount of coverage given to the different NCDs in the three newspapers with the relative disease burden in the UK and Ireland in 2000 and 2015 is presented as a scatter plot in Figure 3. This shows that there is a strongly positive correlation between the two, although RESPI and CARDI appear to be relatively neglected compared with the others. There are fewer stories in the *Irish Times* about cardiovascular disease than in the two UK newspapers (expected, 260; observed, 225; $p < 0.05$). On the other hand, the *Irish Times* gave relatively more space to diabetes than the UK newspapers did (expected, 102; observed, 129; $p < 0.05$), which does correspond to its greater relative burden in Ireland (mean of 2.0% compared with 1.55% in the UK). All three newspapers gave more space to cancer research than to the other NCDs. Although cancer is a major source of disease burden in both countries, the extensive coverage may reflect the large amount of research carried out.

Figure 2. Distribution of media stories between the five non-communicable diseases: IET = Irish Times; DML = Daily Mail; GDN = The Guardian.
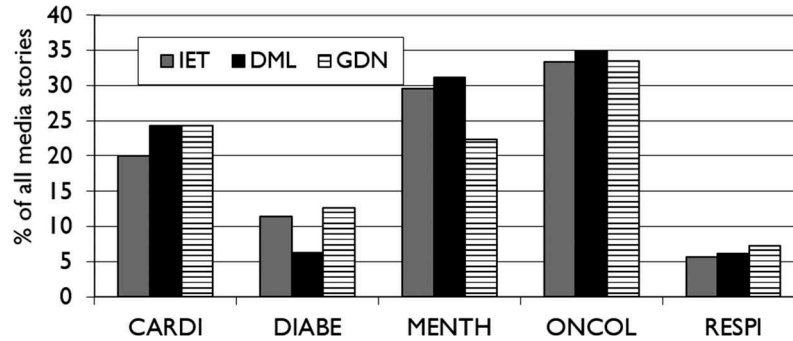
Figure 3. Comparison of the relative coverage given to the five NCDs in the three newspapers with the relative disease burden from them in the UK and Ireland in 2000–2015.
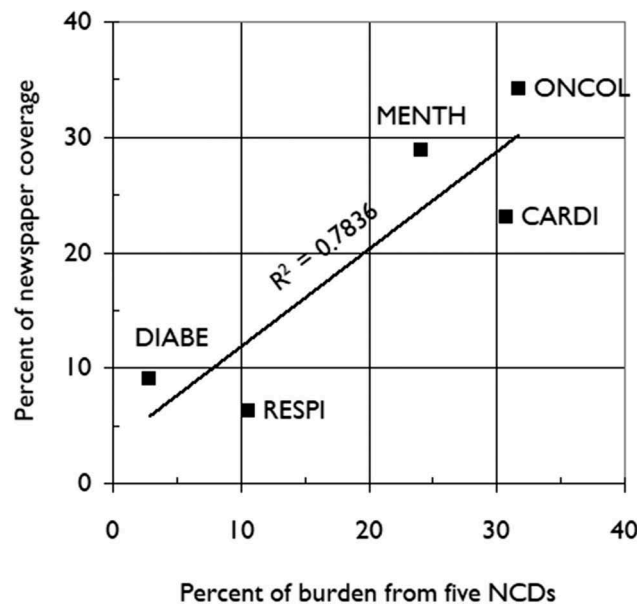
One of the changes in disease burden that has been most noticeable is the reduction in that from cardiovascular disease. Has this been reflected in the amount of coverage of research into this disease? For the *Irish Times*, these stories accounted for 21.2% of the total in 2002–07 but only 19.0% in 2008–13; the change is not statistically significant. But in the two UK newspapers, the reduction was from 27.5% to 22.5% (expected number in 2008–13 = 454; observed number = 372; $p < 0.001$).

The other big change in disease burden was the increase in mental disorders, which increased by 34% in Ireland, but by 51% in the UK, between 2000 and 2015 (Table 1). Coverage of these stories increased from 26% in 2002–07 to 30% in 2008–13 in the two UK newspapers (expected number = 429 in 2008–13, observed number = 496; $p < 0.05$) but the increase (from 28.5% to 30.4%) in the *Irish Times* was not statistically significant.

We next investigated the types of research that were cited by stories in the two largest subject areas, namely cancer (ONCOL) and mental disorders (MENTH). In order to avoid any possible variation between researchers who coded the stories, all the categorizations were based on the bibliographic details of the cited papers with a standard macro. For cancer, the results are in Figure S1a and for mental disorders they are in Figure S1b. For both sets of stories, epidemiology is clearly

the dominant feature in the three newspapers. The *Irish Times* has fewer papers on the genetics of cancer than the two UK papers, but slightly more on the genetic aspects of mental disorders. Prognosis is in third place for both subject areas, and the *Irish Times* has fewer papers than the two UK newspapers on chemotherapy and surgery for cancer, but slightly more on radiotherapy.

The next Figure (S2a and S2b) shows the distribution of cancer research stories by site or manifestation, and the distribution of mental research papers by individual disorder type respectively. Breast cancer attracted by far the most attention from journalists, but much more so in the UK newspapers than in the *Irish Times* (p = 0.13). The *Irish Times* has more stories on lung cancer, which causes the greatest burden among cancers in most countries, than the UK newspapers (p = 0.05), and also more on cervical cancer (p = 0.6). Among mental disorders, Alzheimer's disease and other dementias, followed by depression, are the main subjects for the newspapers. The next most common stories in both sets of newspapers are the addictions: alcoholism and other substances (including gambling). The *Irish Times* has a large number of stories about suicide and self-harm, which appears to be much more of a problem in Ireland than in the UK (2.6% of DALYs in 2015 compared with 1.5%).

The next analysis was of the countries who contributed to the papers cited by the three media. These are shown as fractional counts in Figure S3, with the countries grouped together as follows: USA, UK, Ireland (IE), Other European Union (OEU), Anglophone British Commonwealth (ABC), and Rest of the World (RoW). Only the *Irish Times* gave significant space to Irish research, and its over-citation ratio (compared with the Irish presence in biomedical research in 2002–13 on a fractional count basis) was 14.5/0.37 = 39.

Next, we analysed the commentators chosen by the journalists to put the results of the research in context. We have noted earlier (Pallari & Lewison, 2017) that British media are unusual (in the European context) in quoting the view of external experts in this way, and that they primarily rely on representatives of collecting medical research charities. The *Irish Times* had the most frequent comments, but the *Daily Mail* quoted the largest number of commentators. For further information, see Table S1 (Supplementary file).

The large majority of all the sources of commentary were private-non-profit organisations. The distribution of commenting organisations between the different types is shown in the two parts of Figure S4. The two UK newspapers, but not the *Irish Times*, rely heavily on UK collecting charities, especially Cancer Research UK (total of 186 comments), the two Alzheimer's charities (102 comments) and the British Heart Foundation (97 comments). The *Irish Times* had recourse to Irish charities and non-profit organisations, led by the Irish Cancer Society (28 comments) and the Irish Heart Foundation (23 comments); the Irish Alzheimer's Society provided only 6 comments.

Finally, we tabulated the numbers of men and women who wrote the stories, carried out the research, or commented on the significance of the results. Our analysis is shown in Table 3. The *Daily Mail* had much the highest proportion of female journalists, and the *Irish Times* had relatively the fewest, mainly because so many of its medical research stories were written by one man, Dr Muiris Houston, who contributed 246 stories, much the most of any journalists.

Although the percentage of cited female researchers is only 2.5% greater in the *Daily Mail* than in *The Guardian*, because the numbers are so large the difference is actually statistically highly significant (p < 0.001%).

8. Discussion

Coverage of the five NCDs by the one Irish and two British newspapers reflected the relative disease burden from them, and in particular, the amount of coverage of cardiovascular disease tended to decrease with time, while that of mental disorders increased, reflecting the temporal changes in disease burden. The newspapers greatly over-cited research from their own countries compared with its presence in world research output, and in this respect the journalists were more partisan than scientists:

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Table 3. Numbers of contributions to stories or cited research papers by journalists, researchers and commentators from three newspapers, males and females, and percentage of females (% F)			
Source	**DML**	**GDN**	**IET**
Journalists			
Males	331	25	573
Females	898	25	33
% F	73%	50%	5.4%
Researchers (whose names could be assigned to a gender)			
Males	7375	3459.	3651
Females	4781	2011	2218
% F	39%	37%.	38%
Commentators			
Males	488	120	267
Females	379	99	176
% F	43%	45%	40%

papers were over-cited by the UK newspapers relative to their presence in world biomedical research by between four and five times, while, the *Irish Times* over-cited Irish biomedical research by 39 times. The differences between *Daily Mail* and *The Guardian* in their journalists' choices of research to cite and commentators did not reflect the political differences in their editorial policies.

Finally, although these two British newspapers employed many female journalists to report on medical research, they did not over-empathise the role of women, either as researchers or as commentators. In the UK, women accounted for about 39% of cancer researchers in 2009–11 (M. Begum et al., 2019), and this percentage would have been slightly less in the earlier years of the 21st century, so their presence in the three newspapers (Table 3) is probably representative. Our analysis has shown that the amount of newspaper coverage of the five NCDs in the two countries reflected their relative disease burden, see Figure 3.

There were similarities between the British and Irish papers in their coverage of research on the five NCDs, see Figure 2, but the differences between them did not reflect the differences in disease burden. There is evidence that the two UK newspapers increased their coverage of mental disorders research and decreased that of cardiovascular research over the study period, in keeping with the changes in disease burden that occurred. It is also likely that the lower coverage of cardiovascular research & stroke, compared with cancer, may reflect the societal perception that these diseases are less burdensome and also less susceptible to research (Alonso et al., 2019). There were similar but smaller changes in coverage in the *Irish Times*, but the numbers of stories were too small for these changes to be statistically significant.

The stories in all three newspapers focussed on epidemiology, and to a lesser extent, genetics. The preference for reporting epidemiological research has been shown in previous studies while the latter may be explained by the tendency of newspapers to inappropriately "hype" genomic research as a pathway to a definitive cure (Caulfield & Condit, 2012; Hansen, 1994; Stryker, 2002; Weitkamp, 2003). The disease areas were also similar, though the *Irish Times* had fewer on breast cancer and on Alzheimer's disease, but more on lung cancer and suicide and self-harm. These differences do reflect the relative disease burdens in mental disorders between the countries, but not those from different cancers, which are broadly similar. Thus, suicide and self-harm accounted for a 76% higher burden in Ireland than in the UK. On the other hand, Alzheimer's and other dementias represented 3.1% of DALYs in Ireland in 2015 but 5.5% in the UK, 74% higher. As has been found several times previously

(M. Begum, Pallari et al., 2016; Lewison et al., 2008; Pallari & Lewison, 2017), breast cancer tends to be over-reported compared with its burden. This reflects the amount of research taking place (M. Begum et al., 2018; Lewison & Markusova, 2010; Majidi et al., 2017; Patafio et al., 2016; Sullivan et al., 2014), and also that many deaths among women from breast cancer take place in middle-age rather than old-age, and so attract more attention.

There were preferences by the journalists both to cite research and to quote commentators from their own country, a finding which aligns with previous studies (Bauer et al., 1995; Dumas-Mallet et al., 2019; Fanelli, 2013). This "over-citation" ratio was particularly marked for Ireland, whose biomedical research output is quite small, and accords with other work on country over-citation of its own research papers (Bakare & Lewison, 2017). Of the two UK newspapers, *The Guardian* over-cited UK research by 5.4 times, more than did the *Daily Mail* (4.2 times). This is not what one might have expected as the latter paper appears editorially to be more nationalistic (and was a strong supporter of the UK leaving the European Union, whereas *The Guardian* favoured the UK remaining). The *Daily Mail* cited slightly more research from the USA, from other EU countries, from the Anglophone Commonwealth, and from the Rest of the World. Its science and medical journalists' selection of research articles was therefore rather independent of the paper's main editorial stance.

All three newspapers used charities and other non-profit organisations (often advisory or lobby groups) extensively, particularly the *Daily Mail* (31% of the number of stories) to put the cited research stories in context. It was somewhat surprising that the Eurosceptic *Daily Mail* quoted continental European commentators much more than the more internationalist *The Guardian* (1.1% of the number of stories compared with 0.4%). There was also a small, but significant, preference by the Irish journalists to quote government agencies in their country compared with the UK publications (16 comments, expected number, 8.6, p < 0.05). This may, however, reflect a less timid approach by Irish government employees to engaging with the press than that of their British counterparts who are still very conscious of the long reach of the Official Secrets Acts.

9. Strengths and limitations of this study

The study has some limitations. Time and resource constraints meant that it was limited to two UK newspapers and one Irish one; ideally, we would have covered more from each country in order to have a better range of political viewpoints. There may appear to be a certain amount of personal judgement in the selection, or rather the discarding, of stories, but our rule that there had to be an identifiable cited paper in the WoS meant that there was an objective measure of this. Although the researchers coded the stories by treatment and disease/disorder, these codes were not used for the analysis presented here for which we used the results of standard VBA macros applied to the cited papers.

10. Conclusions

In this study we have examined the reporting of non-communicable disease research in one Irish and two British newspapers. This study may help to inform the scientific community about the topics that journalists want to write about. It can also show society that the battle against NCDs is making progress. By highlighting the role of charities who comment on the significance of the new results, our study may even encourage donations, and so help to support medical research. We were also slightly surprised to discover that the coverage of research from different countries, and the choice of commentators, did not conform to the editorial stances of the *Daily Mail* and *The Guardian* but were more independent. However, the journalists over-favoured both researchers and commentators from their own country, especially in the *Irish Times*.

Our analysis has shown that journalists are aware of the changing pattern of NCDs, and that some are imposing a progressively greater burden while others are decreasing in severity. This may modify public attitudes to different diseases and the funding available for research. Examples of such modifications to social perceptions might be closer communication of scientists with journalists, well-informed public health campaigns on the diseases of growing importance, and better governmental decisions on health policy.

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