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Disclosure of funding and conflicts of interest in press releases and the news: A retrospective observational study

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Disclosure of funding and conflicts of interest in press releases and the news: A retrospective observational study

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Objectives. To examine how often study funding and author conflicts of interest are stated in in science and health press releases and in corresponding news; and whether disclosure in news is associated with disclosure in press releases. Second, to specifically examine disclosure rates in industry-funded studies.

Design. Retrospective quantitative content analysis.

Setting. Press releases about health, psychology or neuroscience research from research universities and journals from 2011 (n=996) and 2015 (n=254) and their associated news stories (n=1250 and 578).

Primary outcome measure. Mention of study funding and author conflicts of interest.

Results. In our 2011 cohort, funding was reported in 94% (934/996) of journal articles, 29% (284/996) of press releases and 9% (112/1250) of news. The corresponding figures for 2015 were similar: 84% (214/254), 52% (131/254) and 10% (58/578). A similar pattern was seen for the industry funding subset. If the press release reported study funding, news was more likely to: 22% if in the press release vs 7% if not in the press release (2011), RR 3.1 (95% CI: 2.1 to 4.3); for 2015, corresponding figures were 16% vs 2%, RR 6.8 (95% CI: 2.2 to 17). In journal articles, 27% and 22% reported a conflict of interest, while less than 2% of press releases or news ever mentioned these.

Conclusions. Press releases and associated news did not frequently state funding sources or conflicts of interest. Funding information in press releases was associated with such information in news. Given converging evidence that news draws on press release content, including statements of funding and conflicts of interest in press releases may lead to increased reporting in news.

Article Summary: Strengths and limitations of this study.

- 1 - How often press releases and news report study funding and conflicts of interest is
- 2 assessed using a large cohort of press releases (1250) and news (1828) across two
- 3 separate years.
- 4 - The association between news and press release reporting is also assessed.
- 5 - The study is correlational and retrospective

6 Introduction

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8 Medical journals, funders, and academic institutions routinely call on researchers to
9 disclose funding sources and financial conflicts of interest. Doing so promotes public trust
10 in the research process and allows readers to decide whether industry entanglements
11 merit heightened skepticism when interpreting results.

12 There are no corresponding disclosure requirements for research reported in the
13 lay press: only 3% of the largest circulation US newspapers had an explicit policy about
14 reporting industry funding of medical research [1]. Published reports have documented
15 substantial underreporting of author conflicts of interest and industry funding in the lay
16 media [2-4]. Such underreporting matters since many people - including physicians [5] -
17 learn about the results of medical research from the news [6].

18 The majority of news stories about news health-related discoveries are stimulated
19 by press releases from universities or academic journals. Several studies suggest that press
20 releases may strongly influence the content of subsequent media coverage. For example,
21 news stories were more likely to report absolute risks, intervention harms and study
22 limitations when they were reported in the medical journal press release [3]. Similarly,
23 causal claims from correlational data, exaggerated inference to humans from animal
24 research and 'spin' in news stories - or caveats to mitigate such exaggeration - tracked with
25 their presence or absence in corresponding press releases [7-13].

26 We analysed how often funding and conflicts of interest are mentioned in
27 biomedical and health news stories and their corresponding journal and institution press
28 releases. We examined whether the presence of such statements in news is associated with

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3 29 the presence in press releases. We then specifically examine the subset of studies that had
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5 30 industry funding.
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8 31 **Methods**

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10 33 We analyzed two collections of health-related news stories, press releases and
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12 34 associated journal articles. This first contains 1250 news stories, 996 press releases and
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14 35 996 associated journal articles [8,9]. This database was collated by selecting all the press
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16 36 releases related to human health published throughout 2011 from 8 leading international
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18 37 biomedical journals (Lancet, British Medical Journal (BMJ), Science, Nature, Nature
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20 38 Neuroscience, Nature Immunology, Nature Medicine and Nature Genetics) and 20 leading
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22 39 UK universities (The Russell Group). The corresponding journal article for each press
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24 40 release was sourced, as were subsequent news stories in mainstream print and internet
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26 41 outlets [8,9]. The second database [12,13] contains 1250 news stories, 254 press releases
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28 42 and 254 associated journal articles. This was collated by selecting press releases related to
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30 43 human health published between January and June 2015, from 26 universities (including
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32 44 the Russell Group) and 26 journals (10 in the BMJ group, 16 in the BMC group).
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38 45 Press releases were identified from publicly available repositories (web pages or
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40 46 EurekAlert) or nonpublic sites for journalists (Nature Publishing Group provided us with
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42 47 free access to all their press releases). The inclusion criteria were: health-related topic
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44 48 (broadly defined to include all biomedical sciences, diet, lifestyle, psychology) based on a
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46 49 peer-reviewed published journal article (that we could access). In the 2011 set all eligible
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48 50 press releases were included. In the 2015 set, the contribution from each institution had
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50 51 been capped to 10 press releases, selected randomly if more than 10 were available (for
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52 52 feasibility reasons [12,13]).
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3 53 To identify any print and online news stories related to each press release, we
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5 54 searched Lexis-Nexis, BBC.co.uk, uk.reuters.com, and Google with keywords up to 28 days
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7 55 after publication of the press release, and up to one week before (to allow for potential news
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9 56 before the embargo was lifted).
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14 58 Funding - general

15 59 Journal articles, press releases and related news coverage were coded by research
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17 60 assistants using a pre-specified protocol, to extract information about study funding and
18
19 61 the authors' reported conflicts of interest. Study funding was coded as *industry* (e.g.
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21 62 GlaxoSmithKline, Pfizer etc.), *government* (e.g. the research councils such as the NIH and
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23 63 US National Cancer Institute, MRC, BBSRC, ESRC etc.), *charity* (e.g. Wellcome Trust, Cancer
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25 64 Research UK, the British Heart Foundation etc.), *internal/other* (e.g. self- or university-
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27 65 funded), or *none mentioned*. The largest or first-mentioned source was always coded, and
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29 66 then industry funding if it was listed (see below).
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50 68 Industry funding.

51 69 For the specific focus on industry funding, a study was designated industry-funded if any of
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53 70 the funding sources mentioned included industry, regardless of position in the list of
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55 71 funders.
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72 73 Conflicts of interest

74 74 Coders looked for the "Conflict of interest" or "Competing interests" sections of the article
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76 75 and determined whether there was no declaration found, a declaration of no conflict of
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3 76 interest (e.g. "The authors declare no conflict of interest") or whether any author declared
4
5 77 conflicts of interest (e.g. "Author X is a paid consultant to Y company").
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8 78 The press releases and news stories were similarly coded for whether funding or
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10 79 conflicts of interest were reported, and whether the press release and news specifically
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12 80 mentioned industry funding. Each Press release and news was also coded for whether it
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14 81 mentioned conflicts of interest declared by the authors, mentioned that no conflicts of
15
16 82 interest were declared or had no mention.
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21 22 84 Coding reliability

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24 85 For the 2011 set, a second research assistant independently coded a randomly selected
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26 86 sample of 28% of press releases and associated news (23% of total news stories). Observed
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28 87 agreement was 94% for coding the type of funding source, 92% for whether PR reported
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30 88 funding, 94% for whether news reported funding, 98% for the study's conflict of interest
31
32 89 statement, and 99% for both whether press release and news mentioned conflict of interest
33
34 90 (we do not calculate kappa as it is unreliable when agreement is this high). For the 2015
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36 91 set, a second research assistant independently coded all texts, and any discrepancies were
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38 92 subsequently highlighted and discussed to reach a consensus conclusion. A third research
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40 93 assistant arbitrated if disagreements remained (very rare).
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49 95 Analysis

50 96 We first report analyses of all journal articles and associated press releases (n=996 for
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52 97 2011, n=254 for 2015) descriptively, followed by descriptive analysis of news (n=1,250
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54 98 news and 578 news, respectively). These are separated by year to illustrate the natural
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3 99 range of fluctuation, rather than to examine trends with time (the differences in sampling
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5 100 would undermine such analysis). Descriptive analyses were done in Stata 14.2 (College
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8 101 Station, TX).

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10 102 Since the main association analyzed - relating the mention of funding in press
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12 103 releases to news stories - is limited to the press releases with media coverage (n=429 for
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14 104 2011, n=134 for 2015), we also give descriptive information for these subsets in Table 1.
15
16 105 To examine the relationship between news and press releases, we used generalized
17
18 106 estimating equations (GEE) to account for clustering of news stories for each press release
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20 107 (using an exchangeable working correlation; in SPSS, Version 23.). Odds ratios were
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22 108 converted to relative risks. For conflicts of interest, the association between press releases
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24 109 and news could not be analysed because so few news stories mentioned conflicts of
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26 110 interest.
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33 112 **Results**

34 113 *Disclosure of study funding and coi in the journal article*

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36 114 Among all 996 studies in 2011, 94% listed sources of funding in the journal article and 17%
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38 115 reported industry funding (**Table 1**). The corresponding figures for 2015, among 254
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40 116 studies, were 84% and 7%, respectively. In about one-quarter of studies (27% and 22%
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42 117 for 2011 and 2015), authors declared ≥ 1 conflict of interest (coi).
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49 119 *Disclosure of study funding and coi in the press release*

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51 120 Press releases reported a funding source 29% and 52% of the time (respectively for 2011
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53 121 and 2015). Press releases specifically mentioned industry funding when promoting
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55 122 industry-funded studies 14% and 41% of the time, respectively. In the larger sample (2011
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3 123 cohort) we could divide press releases issued by universities from those issued by journals;
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5 124 the universities were more likely to mention a funding source (59% vs 5%; absolute
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8 125 difference=54%, 95% CI: 49% to 59%). Reporting of conflicts of interest was rarer: 0%
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10 126 and 2% of press releases (for 2011 and 2015) mentioned a conflict of interest where one
11
12 127 was declared in the journal article. Reporting of no conflicts was similarly rare: 0.4% and
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15 128 0% of press releases explicitly reported no conflict for studies that explicitly declared none.
16
17 129 For example, a university press release of an industry-funded study highlighted the
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19 130 authors' independence: "Painful periods increase sensitivity to pain throughout the
20
21 131 month", included the statement "The study was funded by Pfizer and the Oxford Biomedical
22
23
24 132 Research Centre. The researchers designed, carried out and reported the study
25
26
27 133 independently of the funders".
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134

135 *Disclosure of study funding and coi in news stories*

136 Reporting of funding sources in news stories was low: 9% for all studies; 17% for industry-
137 funded studies in 2011; 10% for all studies and 0% for industry-funded studies in 2015.
138 Reporting of conflicts of interest was even rarer: 1% and 0% of news stories (for 2011 and
139 2015) reported a conflict in the studies where a conflict was declared in the journal article,
140 while 0.1% and 0% of news explicitly reported no conflict for studies that explicitly
141 declared none.

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143 *Relationship of funding source in press release and the news*

144 If the press release reported a funding source, associated news stories were more
145 likely to report it (**Figure 1**). For the 2011 cohort, 22% of news stories reported funding if

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3 146 in the press release vs 7% if not in the press release; Relative risk 3.1 (95% CI: 2.1 to 4.3);
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5 147 Absolute difference 15% (95% CI: 8% to 23%). For the 2015 cohort, 16% of news stories
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7 148 reported funding if in the press release vs 2% if not in the press release, RR 6.8 (95% CI:
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9 149 2.2 to 17). The results were similar among the subset of 226 news from industry funded
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11 150 studies in 2011: 15% of news stories reported industry funding if in the press release vs
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13 151 7% if not in the press release; Relative risk = 2.1 (95%CI 0.94 to 4.5); Absolute difference
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15 152 8% (95%CI : 0% to 18%). For 2015, there were no reports in news of industry funding
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17 153 from the (much smaller) subset of industry funded studies (see Table 1).
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155 **Discussion**

156 Our study highlights that reporting of funding sources is not high in either news or
157 press releases from major biomedical journals and leading UK research universities.
158 Neither was industry funding mentioned in the majority of news or press releases based on
159 studies with industry funding. Mentioning conflicts of interest – or stating that there were
160 none – was almost vanishingly rare. Note that we do not infer anything from the
161 fluctuations between years. We were not attempting to analyse trends with time, and the
162 two databases has some differences in sampling method that could confound such analysis.
163 Rather the two cohorts simply illustrate the range of results from different samples.

164 We additionally observed that university press releases mentioned funding many
165 more times than journal press releases did (in the cohort where we could analyse this).
166 This difference deserves explanation, but we can only speculate. We believe authors and
167 universities feel obliged (and are sometimes explicitly obliged) to acknowledge their
168 funders – without whom the research could not have taken place. It is also likely that
169 mentioning funders lends authority (to get funding, research projects must normally win a

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3 170 highly selective competition). Journals have their own selective processes for publication,
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5 171 and appear not to feel the need to mention funders, either to acknowledge them or to
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8 172 enhance authority.

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10 173 Consistent with prior work [3, 8-13], we observed that information - in this case
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12 174 funding source - is more likely to appear in the news when it is noted in the press release.
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15 175 Given that press releases are used as sources for news, this correlation is likely to contain a
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17 176 causal element, providing a potential means to increase the frequency with which news
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19 177 mentions funding and conflicts of interest, should authors and institutions wish to do so.

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22 178 Disclosure of study funding and author conflicts interests matters: non-disclosure
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24 179 may undermine public and professional trust in the integrity of the research, while
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26 180 disclosure encourages readers to approach findings with appropriate skepticism. In the
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29 181 'post-truth' era of mass information with varying credibility [16], it is particularly
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31 182 important for science and health research to be trusted.

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34 183 Disclosure can only be effective if it reaches readers, most of whom - including many
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36 184 physicians [5] - learn about new research in the lay press. The level of underreporting that
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38 185 we observed may reflect the lack of explicit media policies about reporting industry
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40 186 funding [1]. We hope that this could change. It could be beneficial if press offices at medical
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43 187 journals, funders and academic institutions were to routinely highlight funding and
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45 188 disclosures in their press releases. One way to routinely operationalize this approach
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48 189 would be to add standard headers in press releases for funding and conflicts of interest as
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50 190 is done in many medical journals. Formal testing of alternate content and formats would
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52 191 inform the creation of more effective press releases. If press releases were made openly
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3 192 available and linked to publications for peers to scrutinize, this might remind authors to
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5 193 declare their conflicts of interest.
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8 194 A strength of this study is the large datasets of over 1200 press releases, 1200
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10 195 journal articles and 1800 news when taken together. Several study limitations should be
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12 196 acknowledged. First, although we searched multiple databases attempting to target all
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14 197 major print and online news outlets, we may have missed some media coverage. While
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16 198 press releases for the leading UK academic universities and many leading Journals were
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18 199 covered, and there is no reason to suspect major differences between countries [9,10], or
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20 200 non-included journals, we cannot rule out that countries differ or that some journals or
21
22 201 universities may have different press release policies. Further, since the association
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24 202 between press releases and news stories is observational, we suspect but cannot prove
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26 203 causation, nor can we be sure that this relationship is generalizable to all other media, such
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28 204 as social media. Another limitation is that statements about conflicts of interest in journal
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30 205 articles tend to focus on potential financial interests. Other potential conflicts can arise that
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32 206 are not stated [14,15], and thus not analysed here. For example, belonging to a professional
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34 207 organization or a research network or consortium can potentially result in entrenched
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36 208 viewpoints. Competition and reward structures within academia can also result in conflicts
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38 209 of interests.
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45 210 In conclusion, we believe the research community's commitment to disclosing
46
47 211 funding and conflicts of interest should extend to press releases - the most direct way that
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49 212 researchers communicate with the media. This does not seem to be the norm in most press
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51 213 releases issued by academic institutions and journals (at least in 2011 and 2015). It is likely
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214 that including such information in press releases would raise the rate is it reported in
215 news.

216

For peer review only

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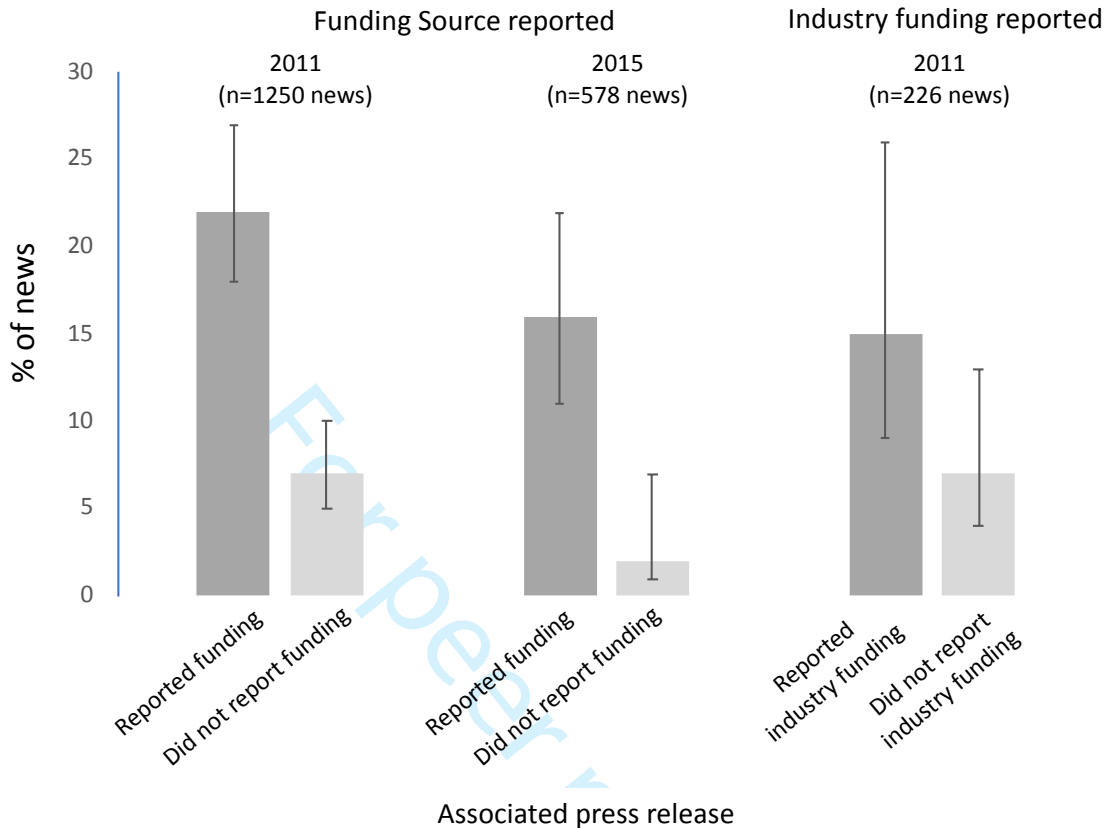
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Table 1 Frequency of funding sources and conflicts of interest in journal articles, press releases and news reports

	All Studies		Studies with media coverage	
	2011 n=996	2015 n=254	2011 n=429	2015 n=134
Information in journal article				
<i>Funding source reported</i>				
Any industry	17% (169/996)	7% (17/254)	19% (82/429)	7% (9/134)
Single non-industry sources				
Internal	4% (38/996)	8% (20/254)	4% (18/429)	8% (11/134)
Charity	13% (125/996)	6% (16/254)	13% (55/429)	8% (11/134)
Government	6% (56/996)	28% (71/254)	6% (24/429)	22% (30/134)
Multiple non-industry sources	55% (546/996)	41% (104/254)	52% (222/429)	42% (56/134)
None stated	6% (62/996)	16% (40/254)	7% (28/429)	18% (24/134)
<i>Authors conflict of interest disclosed</i>				
Declare "none"	57% (563/996)	50% (126/254)	54% (231/429)	48% (64/134)
Declare ≥ 1 conflict	27% (268/996)	22% (55/254)	29% (123/429)	21% (28/134)
No statement	16% (165/996)	29% (73/254)	17% (75/429)	31% (42/134)
Information in press releases				
<i>Funding source reported</i>				
Report any funding source				
All press releases	29% (284/996)	52% (131/254)	35% (150/429)	57% (76/134)
University	59% (253/426)	—	62% (127/206)	—
Journal	5% (31/570)	—	10% (23/223)	—
Report industry funding as % of studies with industry funding	14% (24/169)	41% (7/17)	24% (20/82)	44% (4/9)
<i>Authors conflict of interest disclosed</i>				
Report coi as % of studies where coi declared	0.5% (1/268)	2% (1/55)	0% (0/123)	4% (1/28)
Report no coi as % of studies that declared none	1% (4/563)	0% (0/126)	0.4% (1/231)	0% (0/64)
Information in news stories				
<i>Funding source reported</i>				
Report any funding	—	—	9% (112/1250)	10% (58/578)
Report industry funding as % of studies with industry funding	—	—	17% (38/226)	0% (0/27)
<i>Authors conflict of interest disclosed</i>				
Report coi as % of studies where coi declared	—	—	1% (4/380)	0% (0/114)
Report no coi as % of studies that declared none	—	—	0.1% (1/675)	0% (0/286)



220
221 **Figure 1.** Proportion of news stories reporting study funding source or industry funding
222 according to whether the associated press release reported the funding source or industry
223 funding. There were zero mentions of industry funding in news in 2015 dataset, so analysis
224 not performed. Error bars are 95% CI. The relative risks for the three plots are: 3.1 (95%
225 CI: 2.1 to 4.3); 6.8 (95% CI: 2.2 to 17); 2.1 (95%CI 0.94 to 4.5).
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Disclosure of study funding and author conflicts of interest in press releases and the news: A retrospective content analysis with two cohorts.

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Competing Interest Statement - The authors have no conflicts to declare.

Authorship PS, LMS, SW and CC designed the study based on LMS' suggestion. PS and CC collated the 2011 data and LB coded and collated the 2015 data. LMS and PS did the analyses. LMS wrote the first draft and PS wrote subsequent drafts with key contributions from SW, LB and CC.

Data sharing Data are publicly archived at <https://osf.io/apc6d/>

Word count: 2400

Objectives. To examine how often study funding and author conflicts of interest are stated in science and health press releases and in corresponding news; and whether disclosure in press releases is associated with disclosure in news. Second, to specifically examine disclosure rates in industry-funded studies.

Design. Retrospective content analysis with two cohorts.

Setting. Press releases about health, psychology or neuroscience research from research universities and journals from 2011 (n=996) and 2015 (n=254) and their associated news stories (n=1250 and 578).

Primary outcome measure. Mention of study funding and author conflicts of interest.

Results. In our 2011 cohort, funding was reported in 94% (934/996) of journal articles, 29% (284/996) of press releases and 9% (112/1250) of news. The corresponding figures for 2015 were: 84% (214/254), 52% (131/254) and 10% (58/578). A similar pattern was seen for the industry funding subset. If the press release reported study funding, news was more likely to: 22% if in the press release vs 7% if not in the press release (2011), RR 3.1 (95% CI: 2.1 to 4.3); for 2015, corresponding figures were 16% vs 2%, RR 6.8 (95% CI: 2.2 to 17). In journal articles, 27% and 22% reported a conflict of interest, while less than 2% of press releases or news ever mentioned these.

Conclusions. Press releases and associated news did not frequently state funding sources or conflicts of interest. Funding information in press releases was associated with such information in news. Given converging evidence that news draws on press release content, including statements of funding and conflicts of interest in press releases may lead to increased reporting in news.

Article Summary: Strengths and limitations of this study.

Strengths

- 1 - Reporting of study funding and conflicts of interest was assessed using a large cohort of
- 2 press releases (1250) and news (1828) across two cohorts from separate years.
- 3 - The association between news and press release reporting was also assessed.

Limitations

- 4 - The study is correlational and retrospective
- 5 - The data included mainstream newspapers and internet media, but not broadcast media or
- 6 social media.
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3 8 - Generalisability to other countries and languages is unknown.
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9 **Introduction**

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11 Medical journals, funders, and academic institutions routinely call on researchers to
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13 disclose funding sources and financial conflicts of interest. Doing so is designed to increase
14
15 the trustworthiness of the research process and allows readers to decide whether industry
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17 entanglements merit heightened skepticism when interpreting results.
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21 There are no corresponding disclosure requirements for research reported in the
22
23 lay press: only 3% of the largest circulation US newspapers had an explicit policy about
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25 reporting industry funding of medical research [1]. Published reports have documented
26
27 substantial underreporting of author conflicts of interest and industry funding in the lay
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29 media [2-4]. Such underreporting matters since many people - including physicians [5] -
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31 learn about the results of medical research from the news [6].
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35 The majority of news stories about news health-related discoveries are stimulated
36
37 by press releases from universities or academic journals. Several studies suggest that press
38
39 releases may strongly influence the content of subsequent media coverage. For example,
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41 news stories were more likely to report absolute risks, intervention harms and study
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43 limitations when they were reported in the medical journal press release [4]. Similarly,
44
45 other aspects of news reports appear strongly associated with the wording and
46
47 information in corresponding press releases, such as making causal claims from
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49 correlational data, exaggerating the relevance to humans of animal research, 'spin', or
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51 caveats to mitigate such exaggeration [7-13].
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3 30 We analysed how often funding and conflicts of interest are mentioned in
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5 31 biomedical and health news stories and their corresponding journal and institution press
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7 32 releases. We examined whether the presence of such statements in press releases is
8
9 33 associated with their presence in news. We then specifically examine the subset of studies
10
11 34 that had industry funding.
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15 35 **Methods**

16 36
17 37 **Study design.** We scrutinised two collections of health-related news stories, press releases
18
19 38 and associated journal articles for reports of funding and conflicts of interest. We analysed
20
21 39 the reporting frequencies and the association between reports in news and press releases.
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27 41 **Source materials.** The first database contains 1250 news stories, 996 press releases and
28
29 42 996 associated journal articles [8,9]. This database was collated by selecting all the press
30
31 43 releases related to human health published throughout 2011 from 8 leading international
32
33 44 biomedical journals (Lancet, British Medical Journal (BMJ), Science, Nature, Nature
34
35 45 Neuroscience, Nature Immunology, Nature Medicine and Nature Genetics) and 20 leading
36
37 46 UK universities (The Russell Group; see **Figure 1**). The corresponding journal article for
38
39 47 each press release was sourced, as were subsequent news stories in mainstream print and
40
41 48 internet outlets [8,9]. The second database [12,13] contains 578 news stories, 254 press
42
43 49 releases and 254 associated journal articles. This was collated by selecting press releases
44
45 50 related to human health published between January and June 2015, from 26 UK
46
47 51 universities (including the Russell Group and additional universities in Adams et al.
48
49 52 2019¹²) and 26 journals (10 journals affiliated with the BMJ group, 16 with the BMC
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51 53 group).
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5 55 **Search methods and inclusion criteria:** Press releases were identified from publicly
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8 56 available repositories (web pages or EurekaAlert) or nonpublic sites for journalists (Nature
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10 57 Publishing Group provided us with free access to all their press releases). The inclusion
11
12 58 criteria were: health-related topic (broadly defined to include all biomedical sciences, diet,
13
14 59 lifestyle, psychology) based on a peer-reviewed published journal article (that we could
15
16 60 access). In the 2011 set all eligible press releases were included. In the 2015 set, the
17
18 61 contribution from each institution had been capped to 10 press releases, selected randomly
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20 62 if more than 10 were available (for feasibility reasons [12,13]). If two press releases for the
21
22 63 same journal article were identified (one from the university and one from the journal),
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24 64 only one was used, randomly selected. To identify any print and online news stories
25
26 65 related to each press release, we searched Lexis-Nexis, BBC.co.uk, uk.reuters.com, and
27
28 66 Google with keywords up to 28 days after publication of the press release, and up to one
29
30 67 week before (to allow for potential news before the embargo was lifted).
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38 69 **Data extraction and coding.** Journal articles, press releases and related news coverage
39
40 70 were coded by research assistants using a pre-specified protocol, to extract information
41
42 71 about study funding and the authors' reported conflicts of interest. Study funding was
43
44 72 coded as *industry* (e.g. GlaxoSmithKline, Pfizer etc.), *government* (e.g. the research councils
45
46 73 such as the NIH and US National Cancer Institute, MRC, BBSRC, ESRC etc.), *charity* (e.g.
47
48 74 Wellcome Trust, Cancer Research UK, the British Heart Foundation etc.), *internal/other*
49
50 75 (e.g. self- or university-funded), or *none mentioned*. The first-mentioned source was always
51
52 76 coded, and then industry funding if it was listed. Therefore studies could belong to more
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3 77 than one category (e.g. *government* and *industry*). For the specific analysis of industry
4
5 78 funding, a study was included if an industry source was mentioned, regardless of position
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7
8 79 in the list of funders. Coders located the "Conflict of interest" or "Competing interests"
9
10 80 sections of the article and determined whether there was no declaration found, a
11
12 81 declaration of no conflict of interest (e.g. "The authors declare no conflict of interest") or
13
14
15 82 whether any author declared conflicts of interest (e.g. "Author X is a paid consultant to Y
16
17 83 company).

18
19 84 The press releases and news stories were simply coded for whether funding or
20
21
22 85 conflicts of interest were reported, and whether the press release and news specifically
23
24 86 mentioned any industry funding.

25
26 87 The raw materials and protocols for the two databases are available at
27
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29 88 <https://figshare.com/articles/dataset/InSciOut/903704> and <https://osf.io/apc6d/>. The
30
31 89 latter also contains the extracted data used for this study, in the folder 'Processed data /
32
33 90 funding and conflicts of interest'.
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36 91
37
38 92 **Coding reliability.** For the 2011 set, a second research assistant independently coded a
39
40 93 randomly selected sample of 28% of press releases and associated news (23% of total
41
42 94 news stories). Observed agreement was 94% for coding the type of funding source, 92% for
43
44 95 whether PR reported funding, 94% for whether news reported funding, 98% for the study's
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46 96 conflict of interest statement, and 99% for both whether press release and news mentioned
47
48 97 conflict of interest (we do not calculate kappa as it is unreliable when agreement is this
49
50 98 high). For coding disagreements, one answer was randomly selected. For the 2015 set, a
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52 99 second research assistant independently coded all texts, and any discrepancies were
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3 100 subsequently highlighted and discussed to reach a consensus conclusion. A third research
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5 101 assistant arbitrated if disagreements remained (very rare).
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10 103 **Analysis.** We first report analyses of all journal articles and associated press releases
11
12 104 descriptively, followed by descriptive analysis of news. These are separated by year to
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14 105 illustrate the natural range of fluctuation, rather than to examine trends with time (the
15
16 106 differences in sampling would undermine such analysis). Descriptive analyses were done in
17
18 107 Stata 14.2 (College Station, TX). Since the main association analyzed - relating the mention
19
20 108 of funding in press releases to news stories - is limited to the press releases with media
21
22 109 coverage, we also give descriptive information for these subsets in Table 1. To examine the
23
24 110 relationship between news and press releases, we used generalized estimating equations
25
26 111 (GEE) to account for clustering of news stories for each press release (using an
27
28 112 exchangeable working correlation; in SPSS, Version 23.)s. For conflicts of interest, the
29
30 113 association between press releases and news could not be analysed because so few news
31
32 114 stories mentioned conflicts of interest.
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40 116 **Patient and public involvement.** No patients or participants were involved in this study.
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44 45 118 **Results**

46 47 119 *Disclosure of study funding and conflicts of interest in the journal article*

48 120 Among all 996 studies in 2011, 94% (934) listed sources of funding in the journal article
49
50 121 and 17% (169) reported industry funding . The corresponding figures for 2015, among 254
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52 122 studies, were 84% (214) and 7% (17), respectively. In about one-quarter of studies (27%
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3 123 and 22% for 2011 and 2015), one or more authors declared a conflict of interest (see Table
4
5 124 1 for all numbers and %).

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9 126 *Disclosure of study funding and conflicts of interest in the press release*

10
11 127 Press releases reported a funding source 29% and 52% of the time (respectively for 2011
12
13 128 and 2015). Press releases specifically mentioned industry funding when promoting
14
15 129 industry-funded studies 14% and 41% of the time, respectively. In the larger sample (2011
16
17 130 cohort) we could divide press releases issued by universities from those issued by journals;
18
19 131 the universities were more likely to mention a funding source (59% vs 5%; absolute
20
21 132 difference=54%, 95% CI: 49% to 59%). Reporting of conflicts of interest was rarer: 0%
22
23 133 and 2% of press releases (for 2011 and 2015) mentioned a conflict of interest where one
24
25 134 was declared in the journal article. Reporting of no conflicts was similarly rare: 0.4% and
26
27 135 0% of press releases explicitly reported no conflict for studies that explicitly declared none.
28
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35 137 *Disclosure of study funding and conflicts of interest in news stories*

36
37 138 For the set of studies with media coverage, reporting of funding sources in news stories
38
39 139 was low: 9% for all studies; 17% for industry-funded studies in 2011; 10% for all studies
40
41 140 and 0% for industry-funded studies in 2015. Reporting of conflicts of interest was even
42
43 141 rarer: 1% and 0% of news stories (for 2011 and 2015) reported a conflict in the studies
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45 142 where a conflict was declared in the journal article, while 0.1% and 0% of news explicitly
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47 143 reported no conflict for studies that explicitly declared none.
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53 145 *Relationship of funding source in press release and the news*

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3 146 If the press release reported a funding source, associated news stories were more
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5 147 likely to report it (**Figure 2**). For the 2011 cohort, 22% of news stories reported funding if
6
7 148 in the press release vs 7% if not in the press release; Relative risk 3.1 (95% CI: 2.1 to 4.3);
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9 149 Absolute difference 15% (95% CI: 8% to 23%). For the 2015 cohort, 16% of news stories
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11 150 reported funding if in the press release vs 2% if not in the press release, RR 6.8 (95% CI:
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13 151 2.2 to 17). The results were similar among the subset of 226 news from industry funded
14
15 152 studies in 2011: 15% of news stories reported industry funding if in the press release vs
16
17 153 7% if not in the press release; Relative risk = 2.1 (95%CI 0.94 to 4.5); Absolute difference
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19 154 8% (95%CI : 0% to 18%). For 2015, there were no reports in news of industry funding
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21 155 from the subset of industry funded studies (n= 9 studies, 27 news; see Table 1).
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29 157 **Discussion**

30 158 Our study highlights that reporting of funding sources is not high in either news or
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32 159 press releases from major biomedical journals and leading UK research universities.
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34 160 Neither was industry funding mentioned in the majority of news or press releases based on
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36 161 studies with industry funding. Mentioning conflicts of interest – or stating that there were
37
38 162 none – was almost vanishingly rare.
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41 163 Consistent with prior work [4, 8-13], we observed that information - in this case
42
43 164 funding source - is more likely to appear in the news when it is noted in the press release.
44
45 165 Given that press releases are used as sources for news, we believe this correlation is likely
46
47 166 to contain a causal element. In turn, this would provide a means to increase the frequency
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49 167 with which news mentions funding and conflicts of interest, should authors and
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51 168 institutions wish to do so (or develop a policy to do so).
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3 169 Disclosure of study funding and author conflicts interests matters: non-disclosure
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5 170 may undermine public and professional trust in the integrity of the research, while
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8 171 disclosure is designed to allow readers to approach findings with appropriate skepticism.
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10 172 In an era of mass information with varying credibility, it is particularly important for
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12 173 science and health research to be trustworthy.

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15 174 Disclosure can only be effective if it reaches readers, most of whom - including many
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17 175 physicians [5] - learn about new research in the lay press. The level of underreporting that
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19 176 we observed may reflect the lack of explicit media policies about reporting industry
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21 177 funding [1]. We hope that this could change. It could be beneficial if press offices at medical
22
23 178 journals, funders and academic institutions were to routinely highlight funding and
24
25 179 disclosures in their press releases. One way to routinely operationalize this approach
26
27 180 would be to add standard headers in press releases for funding and conflicts of interest as
28
29 181 is done in many medical journals. Formal testing of alternate content and formats would
30
31 182 inform the creation of more effective press releases. If press releases were made openly
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33 183 available and linked to publications for peers to scrutinize, this might remind authors to
34
35 184 declare their conflicts of interest.

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39
40 185 A strength of this study is the large datasets of over 1200 press releases, 1200
41
42 186 journal articles and 1800 news when taken together. Several study limitations should be
43
44 187 acknowledged. First, since the association between press releases and news stories is
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46 188 observational, we cannot prove causation. Second, we do not infer anything from the
47
48 189 fluctuations between years. We were not attempting to analyse trends with time, because
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50 190 the two databases have some differences in sampling method that could confound such
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52 191 analysis. Rather the two cohorts simply illustrate the range of results from different
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3 192 samples. Third, although we searched multiple databases attempting to target all major
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5 193 print and online news outlets, we did not include broadcast media, and we may have
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8 194 missed some media coverage. Fourth, the extent of generalisability is uncertain; while
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10 195 press releases for the leading UK academic universities and many leading Journals were
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12 196 covered, and there is no reason to suspect major differences between countries [9,10], or
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14 197 non-included journals, we cannot rule out that countries differ or that some journals or
15
16 198 universities may have different press release policies, nor can we be sure that this
17
18 199 relationship is generalizable to all other media, such as social media. Fifth, statements
19
20 200 about conflicts of interest in journal articles tend to focus on potential financial interests;
21
22 201 non-financial interests can arise that are not stated [14-16], and thus not analysed here.
23
24 202 For example, belonging to a professional organization or a research network or consortium
25
26 203 can potentially result in entrenched viewpoints, while competition and reward structures
27
28 204 within academia can also result in conflicts of interests. Lastly, we simplified our coding to
29
30 205 whether funding or conflicts were present or absent in press releases and news, and did
31
32 206 not capture whether reporting fairly represented the entire set of funding or COI in the
33
34 207 study.
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43 209 We additionally observed that university press releases mentioned funding many more
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45 210 times than journal press releases did (in the 2011 cohort where we could analyse this, see
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47 211 Table 1). This difference deserves explanation, but we can only speculate. We believe
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49 212 authors and universities feel obliged (and are sometimes explicitly obliged) to
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51 213 acknowledge their funders – without whom the research could not have taken place. It is
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53 214 also likely that mentioning funders lends authority (to get funding, research projects must
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3 215 normally win a highly selective competition). Journals have their own selective processes
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5 216 for publication, and appear not to feel the need to mention funders, either to acknowledge
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7 217 them or to enhance authority. We hope that journals will adopt policies to highlight funding
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9 218 and conflicts of interest in their press releases.
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15 220 In conclusion, we believe the research community's commitment to disclosing
16
17 221 funding and conflicts of interest should extend to press releases - the most direct way that
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19 222 researchers communicate with the media. This does not seem to be the norm in most press
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21 223 releases issued by academic institutions and journals (at least in 2011 and 2015). It is likely
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23 224 that including such information in press releases would raise the rate is it reported in
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25 225 news.
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Table 1 Frequency of funding sources and conflicts of interest in journal articles, press releases and news reports. Note that studies could belong to more than one funding category (e.g. *government* and *industry*).

	All Studies		Studies with media coverage	
	2011	2015	2011	2015
Information in journal article	N=996	N=254	N=429	N=134
<i>Funding source reported</i>				
Any funding reported	94% (934/996)	84% (214/254)	93% (401/429)	82% (110/134)
Any industry	17% (169/996)	7% (17/254)	19% (82/429)	7% (9/134)
Single non-industry sources				
Government	6% (56/996)	28% (71/254)	6% (24/429)	22% (30/134)
Charity	13% (125/996)	6% (16/254)	13% (55/429)	8% (11/134)
Internal/other	4% (38/996)	8% (20/254)	4% (18/429)	8% (11/134)
Multiple non-industry sources	55% (546/996)	41% (104/254)	52% (222/429)	42% (56/134)
None stated	6% (62/996)	16% (40/254)	7% (28/429)	18% (24/134)
<i>Authors conflict of interest disclosed</i>				
Declare "none"	57% (563/996)	50% (126/254)	54% (231/429)	48% (64/134)
Declare ≥ 1 conflict	27% (268/996)	22% (55/254)	29% (123/429)	21% (28/134)
No statement	16% (165/996)	29% (73/254)	17% (75/429)	31% (42/134)
Information in press releases				
<i>Funding source reported</i>				
Report any funding source				
All press releases	29% (284/996)	52% (131/254)	35% (150/429)	57% (76/134)
University	59% (253/426)	—	62% (127/206)	—
Journal	5% (31/570)	—	10% (23/223)	—
Report industry funding as % of studies with industry funding	14% (24/169)	41% (7/17)	24% (20/82)	44% (4/9)
<i>Authors conflict of interest disclosed</i>				
Report coi as % of studies where coi declared	0.5% (1/268)	2% (1/55)	0% (0/123)	4% (1/28)
Report no coi as % of studies that declared none	1% (4/563)	0% (0/126)	0.4% (1/231)	0% (0/64)
Information in news stories				
<i>Funding source reported</i>				
Report any funding	—	—	9% (112/1250)	10% (58/578)
Report industry funding as % of studies with industry funding	—	—	17% (38/226)	0% (0/27)
<i>Authors conflict of interest disclosed</i>				
Report coi as % of studies where coi declared	—	—	1% (4/380)	0% (0/114)

Report no coi as % of studies that declared none	—	—	0.1% (1/675)	0% (0/286)
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233 **Figure 1.** Flow diagram describing the two datasets and the available numbers for analysis.

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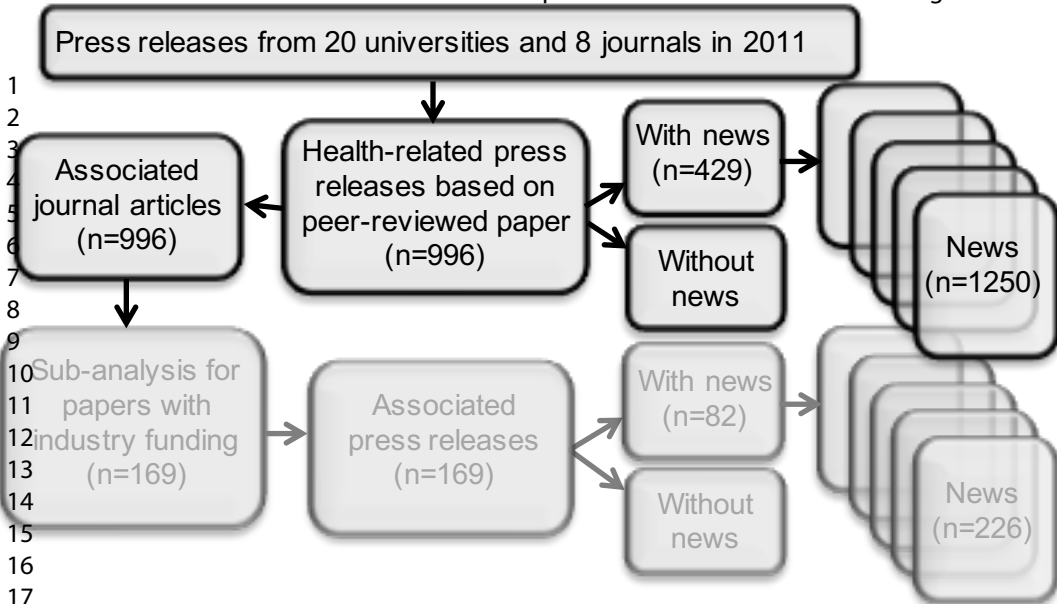
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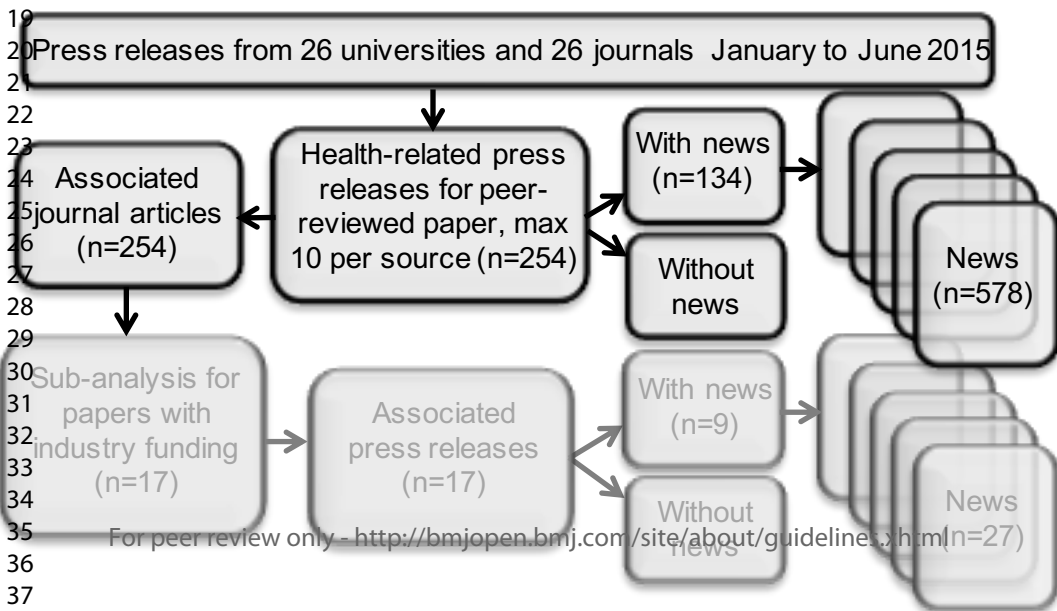
237 **Figure 2.** Proportion of news stories reporting study funding source or industry funding
 238 according to whether the associated press release reported the funding source or industry
 239 funding. There were zero mentions of industry funding in news in 2015 dataset, so analysis
 240 not performed. Error bars are 95% CI. The relative risks for the three plots are: 3.1 (95%
 241 CI: 2.1 to 4.3); 6.8 (95% CI: 2.2 to 17); 2.1 (95%CI 0.94 to 4.5).

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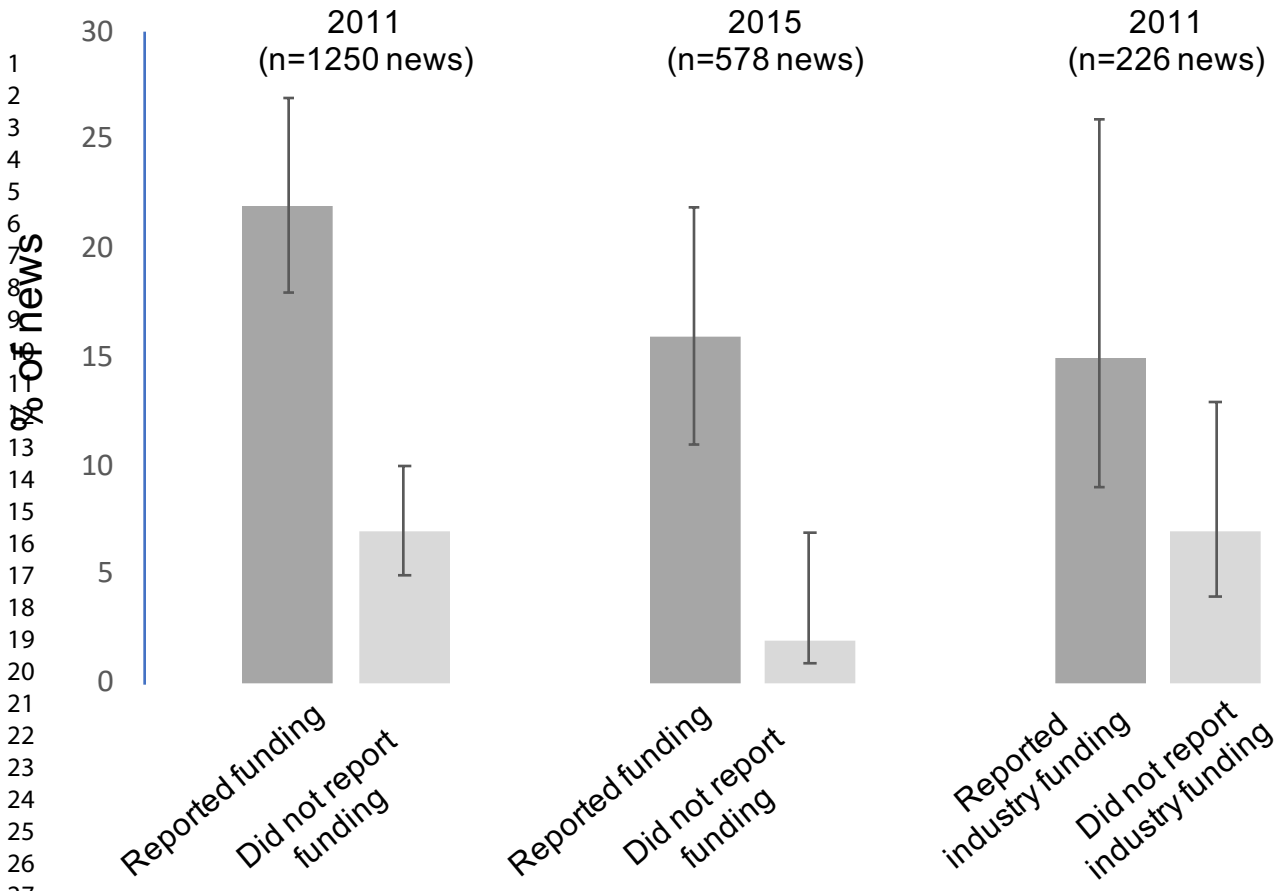


Database 2



Funding Source reported

Industry funding reported



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Associated press release