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What is already known

* The clinical and cost-effectiveness of statins in secondary and primary prevention is established in research and clinical guidance.
* There is continuing clinical debate around the extent & impact of the side-effects of statins and the optimum scale of their use in primary prevention.
* Studies have shown that the lay media can influence people's understanding of health issues and their health related behaviours. However the nature and extent of the debate concerning statins in the lay media is less well documented.

What this study adds

* This study adds insight into the portrayal of preventative medications, and related clinical policy, in the media.
* It suggests there is scope for study authors, policy makers and public health practitioners to promote a more media-friendly, evidence-based narrative on health topics of public interest and concern.

ABSTRACT

Objective

This study reviewed the news media coverage of statins, seeking to identify specific trends or differences in viewpoint between media outlets and examine common themes.

Design

The study is a media content analysis of the frequency and content of the reporting of statins in a selection of the British newsprint media. It involved an assessment of the number, timing and thematic content of articles followed by a discourse analysis examining the underlying narratives. The sample was the output of four UK newspapers, covering a broad spectrum readership, over six months 1 October 2013 - 31 March 2014.

Results

A total of 67 articles included reference to statins. The majority (37, 55%) were reporting or responding to publication of a clinical study. The ratio of negative to positive coverage was greater than 2:1 overall. In the more politically right-leaning newspapers, 67% of coverage was predominantly negative (30/45 articles); 32% in the more left-leaning papers (7/22 articles). Common themes were:

- the perceived 'medicalisation' of the population;
- the balance between lifestyle modification and medical treatments in the primary prevention of heart disease;

- side effects and the effectiveness of statins;
- pharmaceutical sponsorship, and the implications for the reliability of evidence;
- trust between the public and government, institutions, research organisations and the medical profession.

Conclusions

Newsprint media coverage of statins was substantially influenced by the publication of national guidance and by coverage in the medical journals of clinical studies and comment. Statins received a predominantly negative portrayal, notably in the more right-leaning press. There were shared themes: concern about the balance between medication and lifestyle change in the primary prevention of heart disease; the adverse effects of treatment; and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

Strengths and limitations of this study

- The use of media websites for data collection may have excluded some material which was only available in the print versions, and conversely included some material not available in print. It also led to some unavoidable exclusions, for example The Times and The Sun operate a subscription only service.

- The pragmatic selection of the study timescale and media selection may have reduced the representativeness and therefore generalisability of the study. However, the sampling strategy was designed to ensure that the sources represented a reasonable range and diversity of the established newspaper media.
- There was a single researcher and not a research team. This avoided inconsistency in analysis, but led to a risk of bias and potential incompleteness or errors in the identification and selection of articles and the analysis. Research questions and methods were clearly set out at the start and consistently followed, to ensure validity. Analysis by a second researcher of a sub-sample of the sources showed a high level of consistency.
- Blinding was not strictly possible, but articles were coded by a unique numerical identifier to blind the researcher to source during the collection process to reduce bias during the thematic analysis. An inductive approach was applied to ensure that the themes were dictated by the evidence emerging from the texts and were not imposed by the researcher.

INTRODUCTION

UK clinical guidelines recommend the use of lipid lowering therapy for both secondary and primary prevention.[1, 2] This is based on published clinical trial evidence of effectiveness, cost-effectiveness,[1, 3-8] and the extent of side-effects.[7-9] There is debate in the clinical literature about the merits of the widespread and growing use of statins.[10-16] The same issues are also covered in the lay media, where, however, the nature and extent of the debate is less well documented.

There is an identified interaction between the lay and clinical media[17-19] and, importantly, there is evidence that the lay media influences health-related perceptions and behaviours[20-25]. The Chief Medical Officer for England has called for a review into how the safety and efficacy of drugs is judged, prompted by concern about the representation of statins and other drugs “in both the medical and general press”.[26] A recent Dutch study, using national and regional media coverage as a proxy for individual exposure, found that negative statin-related news stories were associated with both early statin discontinuation and cardiovascular mortality.[27]

This study describes the nature of the representation of statins in the newsprint media, investigating the key themes, trends, characteristics and viewpoints.

METHOD

A semi-quantitative descriptive and thematic analysis of the frequency of the coverage of statins in the UK newsprint media was undertaken. Media were selected with the aim of obtaining broad spectrum coverage reflecting a range of editorial leanings and readerships. An initial screening sample was undertaken in order to pilot the methodology and to consolidate the questions and sampling strategy for the main research.[28] This identified what would be practical for one researcher to collect, and enabled refinement of the range and type of outlets, the time period and the type of articles for inclusion in the main data collection. The sampling frame selected for the main study was the UK newsprint media. A purposive sampling strategy was followed, with newspapers selected on the basis that they were accessible, able to be searched and analysed by one researcher in the time available, and demographically, geographically and politically representative of a broad spectrum readership. The selected newspapers were The Daily Mail, The Daily Mirror, The Telegraph and The Guardian. These are all national UK newspapers, recording the highest circulation[1].

[1] The Sun recorded the highest circulation but The Sun and The Times were excluded because they did not have free to access websites.

Table 1 Readership of selected newspapers

Category	Daily Mail	Daily Mirror	The Telegraph	The Guardian
Circulation	1,863,000	1,058,500	555,600	204,400
Average age	58	Not given	61	44
Readership 65+	45%	34%	46%	21%
Gender	51% female	54% male	52% male	52% male
Social class ABC1[2]	64%	43%	87%	89%
Predominant geography [Mori 2005]	83% outside London & Scotland	North	East & South East	London
Predominant political stance[3]	Right	Left	Centre right	Centre left
Market designation	Tabloid	Tabloid	Broadsheet	Broadsheet

Source: National Readership Survey 2014, UK Newspaper Guide 2014, TheMediaBriefing. Figures for 2013.

Full texts of articles were searched by keyword and collected retrospectively from the websites of the selected media outlets over a continuous six month timeframe (1 October 2013 to 31 March 2014). The main search term was “statin”. (“Statins” did not retrieve all mentions.) A further search on “cholesterol”, “cardiovascular” and “heart disease” was undertaken to confirm all relevant articles had been captured. All articles with any recorded mention of statins were screened. All types of article were included.

Articles were downloaded and printed in full. Each article was given a unique reference number, to blind the researcher to source during the analysis, and key descriptors were recorded. A thematic data analysis was then undertaken. A coding scheme provided a consistent framework for data collection and analysis

[2] Social gradings A-E are based on census data. ABC1 represents higher & intermediate to clerical and junior occupations.

[3] Political stance reflects party affiliation in the most recent general election.

and enabled independent third party review. The exclusion criterion was peripheral mention of statins with no associated reporting or comment.

The analysis was in two parts. A semi-quantitative analysis mapped the findings against the descriptive indicators, including whether the coverage was judged to be predominantly positive or negative in terms of the arguments, language, and terminology. Where the proportion of positive and negative comments appeared similar, or where it was difficult to decide on the overall direction, a neutral assessment was given. A qualitative analysis then examined the discourses within a selection of the key themes. A second qualitative researcher independently analysed a small subset of sample articles against the descriptive and thematic headings, to test the reliability of the data collection and thematic selection. There was a high level of consistency between reviewers. Outlets were then tracked back and identified in the results.

There were no confidentiality issues associated with the study as all data sources were within the public domain. Ethics Committee approval was not required.

RESULTS

Searches identified 67 articles **(Table 2)**. In two thirds of articles, statins were the main topic. The majority of articles (37, 55%) were reporting or responding to publication of a clinical study.

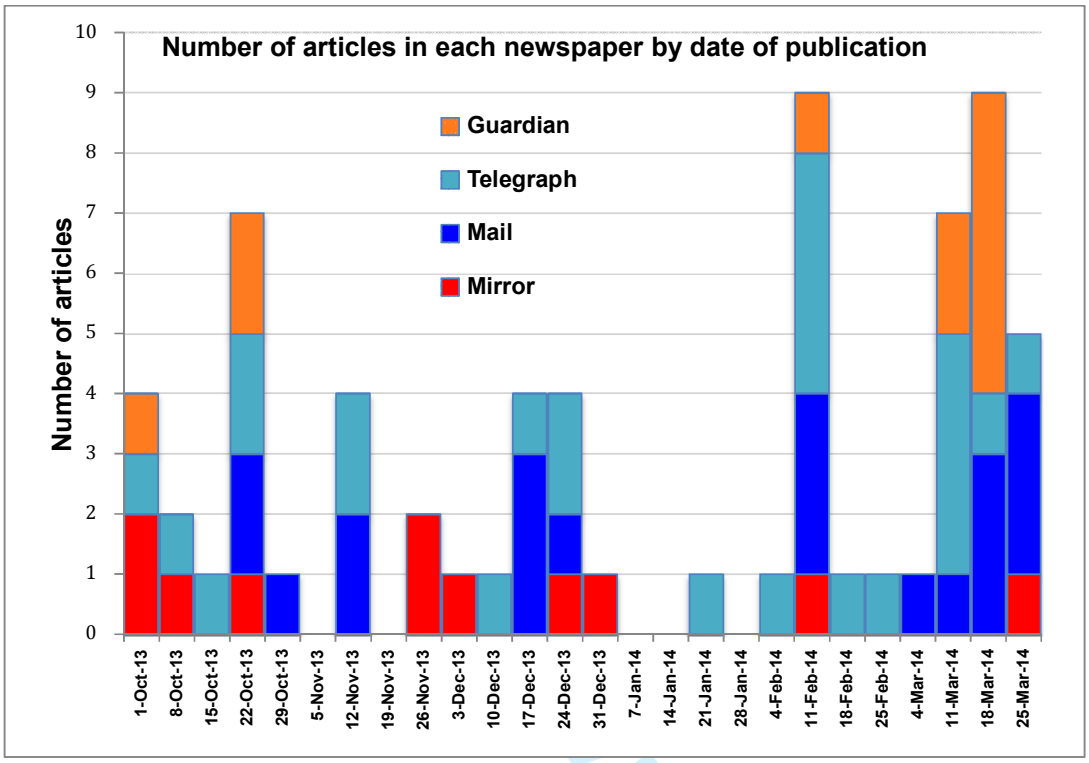
Table 2 Number, stance, and theme of articles mentioning statins 1 October 2013 – 31 March 2014

		Telegraph	Daily Mail	Guardian	Daily Mirror	Total
Number of articles		25	20	11	12*	68
Frequency of article type	Study report	10	13	6	8	37
	Commentary	3	4	2	0	9
	Q&A	2	1	0	0	3
	Personal story	0	1	1	0	2
	News report	1**	1**	0	1**	3
	Letters	2	2	0	0	4
	Expert/'celebrity' commentator	1	2	0	1	4
	Other	1	1	2	0	4
Statins main topic	Main topic	18	14	10	3	45
	Secondary topic	7	6	1	8	22
Positive/ negative	Positive	2	8	3	4	17
	Neutral	3	2	5	3	13
	Negative	20	10	3	4	37

* One article was excluded.
** Publication of NICE and US guidelines on the use of statins

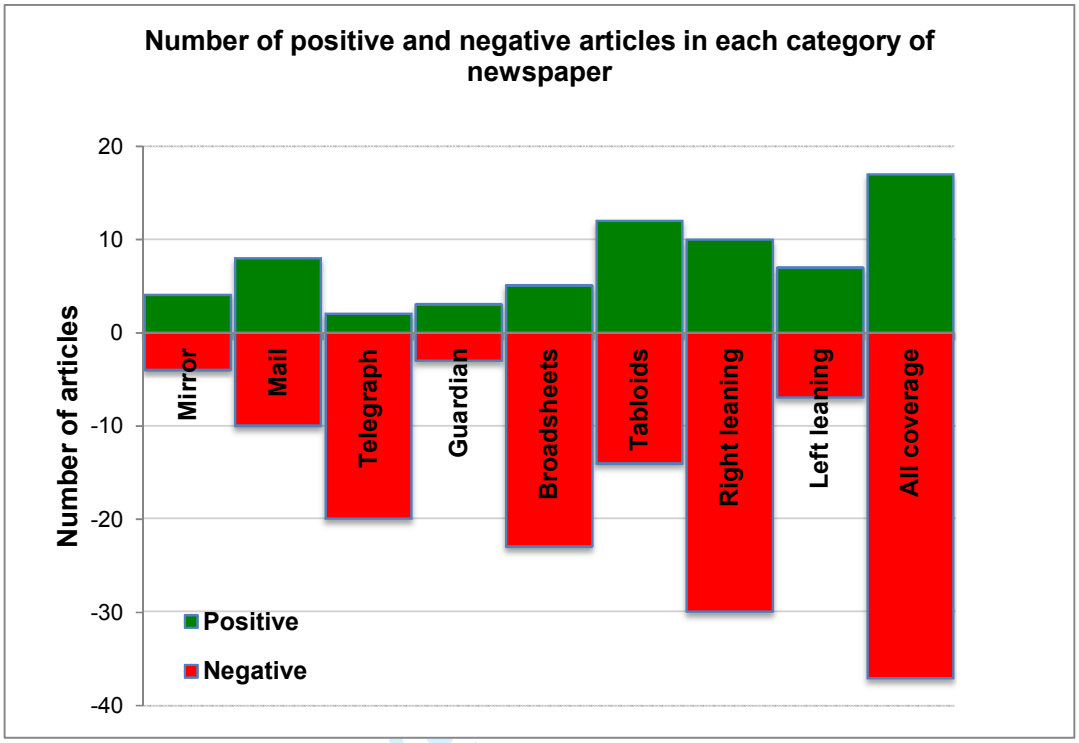
Coverage by outlet by week is shown in **Graph 1**. There is considerable variation, with peaks in coverage weeks commencing 11 February and 18 March. The NICE revised draft guidelines were published on 12 February,[29] covered in 11 articles, prompting the earlier peak. A systematic review of the side-effects of statins[9] was widely reported a month later. In only five of the 26 weeks was there no story about statins.

Graph 1 Coverage by outlet by week, October 2013 – March 2014



The ratio of negative to positive coverage was greater than 2:1 overall **(Graph 2)**. The more right-leaning papers exhibited a ratio of 3:1 negative to positive articles, where the left leaning press had equal proportions of each. The Telegraph had the highest differential with a 10:1 ratio of negative to positive stories. Articles on studies reporting collateral benefits (statins benefiting people with multiple sclerosis or dementia for example) were more likely to portray statins in a positive light.

Graph 2 Positive and negative coverage



Thematic analysis

The themes with the highest number of mentions selected for detailed analysis were: medicalisation versus lifestyle modification; the effectiveness of statins in the light of their side-effects; and trust of those advocating statin therapy.

Medicalisation versus lifestyle modification

The term "medicalisation" is used by three of the four sampled media, both in quotes from contributors and by the article authors. In most cases it is used to denote the introduction of drug treatment for use in an otherwise apparently healthy population. It is used with an exclusively negative meaning:

"the "medicalisation" of people who are not ill… turning five million middle-

aged and predominantly healthy men and women into statin-popping patients." [Mail]

"It is a concern to have to mass medicalise the whole of the British public in this way" [Telegraph] Britain will be confirmed *"the statins capital of Europe"* [Mail]

There is a language of passivity and control. People are "medicalised", "medicated" or "*put on* statins" (emphasis added).

The majority of articles appear supportive of prescribing statins for those with established heart disease. The controversy centres on what proportion of those with risk factors for cardiovascular disease should receive statins as a primary preventative measure:

"there are people who may be overweight or have raised blood pressure. They probably don't have symptoms. They are not ill" [Guardian]

"we'll be medicalising many relatively healthy patients" [Mail] (emphasis added)

The medical profession is seen to be focusing on the medical option in preference to promoting lifestyle change:

"*doctors should first work with patients to put them less at risk… [by]*

stopping smoking, drinking less, taking exercise and eating healthily." [Mail]

However:

It is *"simpler to reach for the pad and write out a prescription than to dole out lifestyle advice"* [National Obesity Forum, Mail and Telegraph]

The public is also indicated to be at fault:

"There is a tendency… for patients (and doctors) to think that as long as they're on statins, smoking or a poor diet doesn't really matter";

"people will see them as a magic pill that allows them to tuck into three pizzas a night and umpteen hamburgers with impunity" ["leading cardiologist", Mail]

Lifestyle measures could actually be the preferable medicine:

"Exercise can be just as efficient as drugs in treating heart disease" [study report, Mirror]

"eating an apple a day is as effective as taking statins" [medical "campaigner", Mail]

Effectiveness and side-effects of treatment

The positioning of "expert" opinion is important here. Who is most qualified to determine the impact of side-effects: clinician, trialist or patient?

Evidence from published studies on the extent of side-effects is reported:

> *"the benefits of statins greatly exceed any side effects"* [Cholesterol trialists study report, Mail].

This is directly challenged by individuals:

> *NICE "will tell you that… one in 10,000 patients… will suffer severe muscular pain…. In contrast, reliable data from the real world… backed up by anecdotal evidence from my experience as a cardiac physician, suggests that the real figure… is closer to one in five."* [cardiologist quoted in Mail]

> *"I know of only three people who have been on statins – I am one of them – and we all experienced debilitating muscle aches"* [reader correspondence, Telegraph]

The "noise" about side-effects may produce the equivalent of a *"nocebo effect"*:

> *"If we tell people about side effects,… we induce these unpleasant symptoms,… inflicting harm on our patients"; "We… shouldn't scare people into experiencing side effects… or into avoiding a medication which might*

help them" ["study author", Guardian]

Statins are portrayed as either villain or hero:

"in years to come, statins could be seen as being as dangerous as thalidomide" [reader correspondence, Mail]

"Statins may reduce dementia by a third" [study report, Telegraph]

Over the six month sample period, statins were associated with potential beneficial effects on dementia, multiple sclerosis and erectile dysfunction.

Trust

A related but distinct theme is trust. Where there is a weight of scientific evidence, there is traditionally expected to be trust in the results. However pharmaceutical companies, often designated *"Big Pharma"*, are almost universally negatively portrayed regardless of the political leanings of the sources, and there is an implied questioning of the value of any evidence from a pharmaceutical industry sponsored trial. An interesting question emerges, concerning which forms of evidence have the greater validity:

NICE recommendations for lowering the threshold for statin treatment are: *"based on solid evidence and the public should trust them"* [US study authors quoted in Mail]

"The drug companies were saying this drug was the best thing since sliced bread"; "their findings are contradicted by independent surveys" and they are *"contrary to the experience of many Telegraph readers"* [response to draft NICE guidelines, Telegraph]

"trials run by the drug companies… are likely to be excessively favourable" [Harvard clinician, Mail]

these same trials are refuted by *"anecdotal accounts… real world data... [and] my experience as a cardiac physician"* [cardiologist, Mail]

The confidentiality of some of the trial data leads to suspicion of what the data contain:

There is no reason *"to accept the analysis of the Oxford team who have seen the data at face value just because they are big and important and professors at Oxford University… . Either they don't have a vast chunk of data or they do and they are not publishing it"* ["Scottish GP and author", Guardian]

Although some academic bodies are still largely to be trusted, for example *"the respected Cochrane group"* [Guardian], other organisations or individuals are contaminated by association:

there are *"arrangements between Big Pharma and academic institutions [and] vested interests in the research"* [Telegraph]

Political and administrative organisations receive a mixed portrayal:

"the government's advice is based on a wealth of evidence. The BMJ article is based on opinion" [Public Health England director quoted in Guardian]

"how can we explain this big gap between… personal experience… of doctors and patients… and official bodies such as NICE?" [Mail]

"*NICE seems to be siding firmly with the drug companies and relying on industry-sponsored statistics"* [Mail]

Family doctors receive consistently negative coverage. Medical authority is portrayed as siding with, or indirectly influenced by, the pharmaceutically sponsored institutions. Doctors are accused of *"inexcusable deviousness"* in their methods for fulfilling screening quotas and in disguising a prescription for statins as *"lipid tablets"* [Telegraph]. There is a risk of:

"more aggressive prescribing of the [statin] medications by family doctors, whose pay is linked to take-up of the pills among their patients" [Mail]

DISCUSSION

This study found that the newsprint media coverage of statins was substantially influenced by the publication of national guidance and by coverage in the medical journals of clinical studies, reports and comment. Statins received a predominantly negative portrayal overall, notably in the more right-leaning press. Specifically, there was considerable coverage of reported side-effects, concern about the balance between medication and lifestyle changes in primary prevention, and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

The findings are consistent with some other studies but also highlight some departures from previous research. The strongest criticism of statins and their effects appears to reflect very closely the debates seen in the medical journals over the same time period.[10-12] Whilst I did not compare coverage between the medical and popular press in any detail, it was evident that there was a substantial commonality of content. In the popular press however there is no discernible difference in the reporting of what the scientific community might describe as important, high quality studies compared with the reporting of small studies with high potential for bias. All views are portrayed with equal weight and seriousness. One notable trend is that reports of new links between, for example, statins and dementia, or statins and impotence, tend to be more uncritical than reports of the use of statins in preventing heart disease. This is also consistent with findings from elsewhere.[30] With a new study, it is simply the results that

are reported, whereas with the role of statins in the prevention of heart disease, it is the debate and controversy that is represented. In terms of the medication versus lifestyle debate, clinical studies disagree about the extent to which health promoting behaviours are actually affected by long term statin use.[31-33] However the newspaper coverage contained a largely judgmental vocabulary around the selection of a medical treatment pathway, suggesting that people who take tablets, or doctors who prescribe them, may be abdicating personal responsibility for health. The question of trust in institutions has also been highlighted in other research. Commentators have identified a similar tendency in the media to exaggerate and seek to mobilise opinion against a "supposed threat" or conspiracy.[34] In contrast, where previous research has placed clinicians - family doctors in particular - high in the hierarchy of public trust,[20, 35] this study found no evidence of positive reporting of the medical profession in relation to statins.

One question arising from this study is whether statins have a distinct status with respect to the debate. The polarisation of good drug/bad drug is not new. Other studies have reported a similarly dichotomised approach in relation to other medical treatments.[36, 21] There are parallels with the representation of the diagnosis and treatment of hypertension, another frequently invisible "sickness" addressed by long term, preventative medication. However in the case of statins, the threshold for treatment appears increasingly to be driven by age rather than specific clinical indicators. (The QRisk cardiovascular risk calculator is strongly influenced by age.) Everyone could eventually become a candidate for medicalisation, however healthy their lifestyle and however low their cholesterol

ratio.

The study highlights a fundamental point concerning the significance of the portrayal of medical issues in the media: is it important that even someone reading across the whole range of newspaper coverage sampled for this study would receive a negative impression of the value of the scientific evidence, and the benefit of statins, when current clinical guidance recommends their use? Coverage in the popular press highlights the confusing messages projected by science and research worldwide. There is no mediating discourse leading people through the pendulum findings of one study or learned commentator after another. The “noise” of the continuing debate may even be frightening people away from taking their prescribed medications, and increasing cardiovascular mortality.[17, 27] This raises an ethical question around the desirability of presenting all viewpoints, however well or ill-evidenced, at the risk of deterring people from acting responsibly with regard to their health. Other studies have suggested there is scope for the scientific and medical worlds to articulate their messages more carefully for popular media consumption.[36, 37, 25] Alternatively, the rawness and transparency of the debate may be a good thing. The ability to see and critique another scientist’s work is valued by researchers, and it may also be of benefit to a non-medical audience to hear the challenge and defence of each viewpoint played out in the public arena. One response is for subject experts to provide an evidence-based commentary on scientific issues of public interest, along the lines of NHS Choices’ “Behind the Headlines”, developed by Sir Muir Gray because “In the same way that people need clean, clear water, they have a right to clean, clear knowledge”.[38]

This study adds insight into the portrayal of preventative medications, and related clinical policy, in the media. There are potential implications for clinicians, study authors, policy makers and public health practitioners. It may be of value for health practitioners to be aware of the messages their patients and the public are predominantly hearing in relation to their medications. There is also considerable scope for all health experts to promote a more media-friendly, evidence-based narrative on health topics of public interest or concern.

Recommendations for further research include a comparison of a wider number of outlets and different areas of medicine over a longer period of time, a comparison of the medical and popular media coverage in detail, and further exploration of the impact of media coverage on reader health behaviours.

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A CONTENT ANALYSIS OF THE REPRESENTATION OF STATINS IN THE BRITISH NEWSPRINT MEDIA

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ABSTRACT

Objective

This study reviewed the news media coverage of statins, seeking to identify specific trends or differences in viewpoint between media outlets and examine common themes.

Design

The study is a content analysis of the frequency and content of the reporting of statins in a selection of the British newsprint media. It involved an assessment of the number, timing and thematic content of articles followed by a discourse analysis examining the underlying narratives. The sample was the output of four UK newspapers, covering a broad-spectrum readership, over a six month timeframe 1 October 2013 - 31 March 2014.

Results

A total of 67 articles included reference to statins. The majority (39, 58%) were reporting or responding to publication of a clinical study. The ratio of negative to positive coverage was greater than 2:1 overall. In the more politically right-leaning newspapers, 67% of coverage was predominantly negative (30/45 articles); 32% in the more left-leaning papers (7/22 articles). Common themes were:

- the perceived ‘medicalisation’ of the population;

- the balance between lifestyle modification and medical treatments in the primary prevention of heart disease;
- side effects and effectiveness of statins;
- pharmaceutical sponsorship, and implications for the reliability of evidence;
- trust between the public and government, institutions, research organisations and the medical profession.

Conclusions

Newsprint media coverage of statins was substantially influenced by the publication of national guidance and by coverage in the medical journals of clinical studies and comment. Statins received a predominantly negative portrayal, notably in the more right-leaning press. There were shared themes: concern about the balance between medication and lifestyle change in the primary prevention of heart disease; the adverse effects of treatment; and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

Strengths and limitations of this study

- The use of media websites for data collection may have excluded some material which was only available in the print versions, and conversely included some material not available in print.

- The pragmatic selection of the study timescale and media selection may have reduced the representativeness and therefore generalisability of the study; however, the sampling strategy was designed to ensure that the sources represented a reasonable range and diversity of the established newspaper media.
- There was a single researcher and not a research team, leading to a potential risk of bias or incompleteness in the identification and selection of articles and the analysis; however research questions and methods were clearly set out at the start and consistently followed, to ensure validity.
- Blinding was not strictly possible, but articles were coded by a unique numerical identifier to reduce bias during the thematic analysis and an inductive approach was applied to ensure that the themes were dictated by the evidence emerging from the texts and not imposed by the researcher.

INTRODUCTION

UK clinical guidelines recommend the use of lipid lowering therapy for both secondary and primary prevention.[1, 2] This is based on published clinical trial evidence of effectiveness, cost-effectiveness,[1, 3-8] and the extent of side-effects.[7-9] There is debate in the clinical literature about the merits of the widespread and growing use of statins, questioning whether the 'right' patients are benefiting, whether the threshold for initiation of primary preventative treatment is too low, and the reliability of the evidence underpinning the guidelines.[10-16] The same issues are also covered in the lay media, where, however, the nature and extent of the debate is less well documented.

There is an interaction between the lay and clinical media, with the same commentators and topics or reported, or directly speaking, in both,[17-21] And importantly, there is evidence that the lay media influences health-related perceptions and behaviours, including reporting of side-effects, uptake of services and adherence to medication.[22-27] The Chief Medical Officer for England has called for a review into how the safety and efficacy of drugs is judged, prompted by concern about the representation of statins and other drugs "in both the medical and general press".[28] A recent Danish study, using national and regional media coverage as a proxy for individual exposure, found that negative statin-related news stories were associated with both early statin discontinuation and cardiovascular mortality.[29]

In the light of this relationship, it is relevant to examine the portrayal of statins in the media, and the messages that are being predominantly received. This study

investigates the nature of the representation of statins in the newsprint media, identifying the key themes, trends, characteristics and viewpoints.

METHOD

A descriptive and thematic analysis of the frequency of the coverage of statins in the UK newsprint media was undertaken. Media were selected with the aim of obtaining broad spectrum coverage reflecting a range of editorial leanings and readerships. An initial screening sample was undertaken in order to pilot the methodology and to consolidate the questions and sampling strategy for the main research.[30] This identified what would be practical for one researcher to collect, and enabled refinement of the range and type of outlets, the time period and the type of articles for inclusion in the main data collection. The sampling frame selected for the main study was the UK newsprint media. A purposive sampling strategy was followed, with newspapers selected on the basis that they were accessible, able to be searched and analysed by one researcher in the time available, and demographically, geographically and politically representative of a broad spectrum readership. The selected newspapers were The Daily Mail, The Daily Mirror, The Telegraph and The Guardian (**Table 1**). These are all national UK newspapers, recording the highest circulation[1].

[1] The Sun recorded the highest circulation but The Sun and The Times were excluded because they did not have free to access websites.

Table 1 Readership of selected newspapers 2013[31, 32]

Category	Daily Mail	Daily Mirror	The Telegraph	The Guardian
Circulation	1,863,000	1,058,500	555,600	204,400
Average age	58	Not given	61	44
Readership 65+	45%	34%	46%	21%
Gender	51% female	54% male	52% male	52% male
Social class ABC1[2]	64%	43%	87%	89%
Predominant geography [Mori 2005]	83% outside London & Scotland	North	East & South East	London
Predominant political stance[3]	Right	Left	Centre right	Centre left
Market designation	Tabloid	Tabloid	Broadsheet	Broadsheet

Full texts of articles were searched by keyword and collected retrospectively from the websites of the selected media outlets over a continuous six month timeframe (1 October 2013 to 31 March 2014). The main search term was “statin” (“statins” did not retrieve all mentions.) A further search on “cholesterol”, “cardiovascular” and “heart disease” was undertaken to confirm all relevant articles had been captured. All articles with any recorded mention of statins were screened. All types of article were included.

Articles were downloaded and printed in full. Each article was given a unique reference number, to blind the researcher to source during the analysis, and key descriptors were recorded. A thematic data analysis was then undertaken. A coding scheme provided a consistent framework for data collection and analysis

[2] Social gradings A-E are based on 2011 census data. ABC1 represents higher & intermediate to clerical and junior occupations.

[3] Political stance reflects party affiliation in the most recent general election. (Right: Conservative, UKIP; left: Labour, Green; Centre right: Conservative, Liberal Democrat; Centre left: Labour, Liberal Democrat.)

and enabled independent third party review. The exclusion criterion was peripheral mention of statins with no associated reporting or comment.

The analysis was in two parts. An initial descriptive analysis mapped the findings against the descriptive indicators, including whether the coverage was judged to be predominantly positive or negative in terms of the arguments, language, and terminology. Where the proportion of positive and negative comments appeared similar, or where it was difficult to decide on the overall direction, a neutral assessment was given. A more detailed qualitative analysis then examined the nature of the discourses within the key themes, including viewpoints, assumptions and language. Outlets were then tracked back and identified in the results. A copy of the coding scheme is available as a supplementary document.

There were no confidentiality issues associated with the study as all data sources were within the public domain. Ethics Committee approval was not required.

RESULTS

Searches identified 67 articles during the time period. A timeline showing overage by outlet by week is shown in **Figure 1**. There is considerable variation, with peaks in coverage weeks commencing 11 February and 18 March. The NICE revised draft guidelines were published on 12 February,[33] covered in 11 articles, prompting the earlier peak. A systematic review of the side-effects of statins[9] was widely reported a month later. In only five of the 26 weeks was there no story about statins.

Figure 1 Coverage by outlet by week, October 2013 – March 2014

In two thirds of articles **(Table 2)**, statins were the main topic. The majority of articles (39, 58%) were reporting or responding to publication of a clinical study.

Table 2 Number, stance, and theme of articles mentioning statins 1 October 2013 – 31 March 2014

		Telegraph	Daily Mail	Guardian	Daily Mirror	Total
Number of articles		25	20	11	11*	67
Frequency of article type	Study report/ response	10 (40%)	13 (65%)	6 (55%)	10 (91%)	39 (58%)
	Commentary	3 (12%)	1 (5%)	2 (18%)	0 (0%)	6 (9%)
	Q&A	2 (8%)	1 (5%)	0 (0%)	0 (0%)	3 (4%)
	Personal story	1 (4%)	1 (5%)	1 (9%)	0 (0%)	3 (4%)
	News report	1** (4%)	1** (5%)	0 (0%)	1** (8%)	3 (4%)
	Letters	4 (16%)	0 (0%)	0 (0%)	0 (0%)	4 (6%)
	Expert/'celebrity' commentator	3 (12%)	2 (10%)	0 (0%)	0 (8%)	5 (7%)
	Other	1 (4%)	1 (5%)	2 (18%)	0 (0%)	4 (6%)
Statins main topic	Main topic	18 (72%)	14 (70%)	10 (91%)	3 (25%)	45 (67%)
	Secondary topic	7 (28%)	6 (30%)	1 (9%)	8 (67%)	22 (33%)

* One article was excluded.
** Publication of NICE and US guidelines on the use of statins

The ratio of negative to positive coverage was greater than 2:1 overall. The more right-leaning papers exhibited a ratio of 3:1 negative to positive articles, where the left leaning press had equal proportions of each. The Telegraph had the highest differential with a 10:1 ratio of negative to positive stories **(Figure 2)**. Articles on studies reporting collateral benefits (statins benefiting people with multiple sclerosis or dementia for example) were more likely to portray statins in a positive light.

Figure 2 Positive and negative coverage

Thematic analysis

The themes with the highest number of mentions selected for detailed analysis were: medicalisation versus lifestyle modification; the effectiveness of statins in the light of their side-effects; and trust of those advocating statin therapy.

Medicalisation versus lifestyle modification

The term "medicalisation" is used by three of the four sampled media, both in quotes from contributors and by the article authors. In most cases it is used to denote the introduction of drug treatment for use in an otherwise apparently healthy population. It is used with an exclusively negative meaning:

> *"the "medicalisation" of people who are not ill… turning five million middle-aged and predominantly healthy men and women into statin-popping patients."* [Mail, 13/2/14]

> *"It is a concern to have to mass medicalise the whole of the British public in this way"* [Telegraph, 11/2/14] Britain will be confirmed *"the statins capital of Europe"* [Mail, 12/2/14]

There is a language of passivity and control. People are "medicalised", "medicated" or "*put on* statins" (emphasis added).

The majority of articles appear supportive of prescribing statins for those with established heart disease. The controversy centres on what proportion of those with risk factors for cardiovascular disease should receive statins as a primary preventative measure:

> *"there are people who may be overweight or have raised blood pressure. They probably don't have symptoms. They are not ill"* [Guardian, 21/3/14]
>
> *"we'll be medicalising many relatively healthy patients"* [Mail, 12/2/14] (emphasis added)

The medical profession is seen to be focusing on the medical option in preference to promoting lifestyle change:

> "*doctors should first work with patients to put them less at risk… [by] stopping smoking, drinking less, taking exercise and eating healthily."* [Mail, 13/3/14]

However:

> *"*[It is] *"simpler to reach for the pad and write out a prescription" than to dole out lifestyle advice"* [National Obesity Forum quoted in Mail and Telegraph, 25/12/13]

The public is also indicated to be at fault:

"There is a tendency… for patients (and doctors) to think that as long as they're on statins, smoking or a poor diet doesn't really matter";

"people will see them as a magic pill that allows them to tuck into three pizzas a night and umpteen hamburgers with impunity" ["leading cardiologist" quoted in Mail, 8/3/14, 13/2/14]

Lifestyle measures could actually be the preferable medicine:

"Exercise can be just as efficient as drugs in treating heart disease" [study report, Mirror, 2/10/13]

"eating an apple a day is as effective as taking statins" [medical "campaigner", Telegraph, 2/3/14]

Effectiveness and side-effects of treatment

The positioning of "expert" opinion is important here. Who is most qualified to determine the impact of side-effects: clinician, trialist or patient?

Evidence from published studies on the extent of side-effects is reported:

"the benefits of statins greatly exceed any side effects" [Cholesterol trialists study report, Mail, 12/2/14].

This is directly challenged by individuals:

> *NICE "will tell you that… one in 10,000 patients… will suffer severe muscular pain…. In contrast, reliable data from the real world… backed up by anecdotal evidence from my experience as a cardiac physician, suggests that the real figure… is closer to one in five.'* [cardiologist quoted in Mail, 13/2/14]

> *"I know of only three people who have been on statins – I am one of them – and we all experienced debilitating muscle aches"* [reader correspondence, Telegraph, 15/3/14]

The "noise" about side-effects may produce the equivalent of a *"nocebo effect"*:

> *"If we tell people about side effects,… we induce these unpleasant symptoms,… inflicting harm on our patients"; "We… shouldn't scare people into experiencing side effects… or into avoiding a medication which might help them"* ["study author", Guardian, 14/3/14]

Statins are portrayed as either villain or hero:

> *"in years to come, statins could be seen as being as dangerous as thalidomide"* [reader correspondence, Mail, 14/11/13]

> *"Statins may reduce dementia by a third"* [study report, Telegraph, 30/12/13]

Over the six month sample period, statins were associated with potential beneficial effects on dementia, multiple sclerosis and erectile dysfunction.

Trust

A related but distinct theme is trust. The reliability of studies or guidelines is traditionally linked to the weight of scientific evidence – usually RCT evidence - underpinning them. However pharmaceutical companies, often designated *"Big Pharma"*, are almost universally negatively portrayed, and there is an implied questioning of the value of any evidence from a pharmaceutical industry sponsored trial. An interesting question emerges, concerning which forms of evidence have the greater validity:

> NICE recommendations for lowering the threshold for statin treatment are: *"based on solid evidence and the public should trust them"* [US study authors quoted in Mail, 13/11/13]
>
> *"The drug companies were saying this drug was the best thing since sliced bread"; "their findings are contradicted by independent surveys"* and they are *"contrary to the experience of many Telegraph readers"* [response to draft NICE guidelines, Telegraph, 2/3/14]
>
> *"trials run by the drug companies… are likely to be excessively favourable"* [Harvard clinician, Mail, 24/12/13]

these same trials are refuted by *"anecdotal accounts… real world data...* [and] *my experience as a cardiac physician"* [cardiologist, Mail, 13/2/14]

The confidentiality of some of the trial data leads to suspicion of what the data contain:

There is no reason *"to accept the analysis of the Oxford team who have seen the data at face value just because they are big and important and professors at Oxford University… . Either they don't have a vast chunk of data or they do and they are not publishing it"* ["Scottish GP and author", Guardian, 21/3/14]

Although some academic bodies are still largely to be trusted, for example *"the respected Cochrane group"* [Guardian], other organisations or individuals are contaminated by association:

there are *"arrangements between Big Pharma and academic institutions [and] vested interests in the research"* [Telegraph, 15/3/14]

Political and administrative organisations receive a mixed portrayal:

"the government's advice is based on a wealth of evidence. The BMJ article is based on opinion" [Public Health England director quoted in Guardian, 23/10/13]

"how can we explain this big gap between… personal experience… of doctors and patients… and official bodies such as NICE?" [Mail, 18/3/14]

"*NICE seems to be siding firmly with the drug companies and relying on industry-sponsored statistics"* [Mail, 13/2/14]

Family doctors receive consistently negative coverage. Medical authority is portrayed as siding with, or indirectly influenced by, the pharmaceutically sponsored institutions. Doctors are accused of *"inexcusable deviousness"* in their methods for fulfilling screening quotas and in disguising a prescription for statins as *"lipid tablets"* [Telegraph, 16/2/14]. There is a risk of:

"more aggressive prescribing of the [statin] medications by family doctors, whose pay is linked to take-up of the pills among their patients" [Telegraph, 11/2/14].

DISCUSSION

This study found that the newsprint media coverage of statins was substantially influenced by coverage in the medical journals of clinical studies, reports and comment. Statins received a predominantly negative portrayal overall, notably in the more right-leaning press. Specifically, there was considerable coverage of reported side-effects, concern about the balance between medication and lifestyle changes in primary prevention, and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

The findings are consistent with some other studies and also highlight some departures from previous research:

- The strongest criticism of statins and their effects in the media appears to reflect very closely the arguments presented in the medical journals over the same time period, although the weighting of the arguments may differ.[10-12] In the popular press there is no discernible difference in the reporting of what the scientific community might describe as important, high quality studies compared with the reporting of small studies, or opinion, with high potential for bias. All views are portrayed with equal weight and seriousness. Other studies have identified greater selectivity in reporting in the popular compared with the specialist media, with a greater focus on more controversial topics.[34]
- A notable trend I identified in the media is for reports of new links between,

for example, statins and dementia, or statins and impotence, to be more uncritical than reports of the use of statins in preventing heart disease. With a new study, the results themselves are the story, whereas with the role of statins in the prevention of heart disease, it is the debate and controversy that is represented.

- In terms of the medication versus lifestyle debate, clinical studies disagree about the extent to which health promoting behaviours are actually affected by long term statin use.[35-37] However the newspaper coverage contained a largely judgmental vocabulary around the selection of a medical treatment pathway, suggesting that people who take tablets, or doctors who prescribe them, may be abdicating personal responsibility for health.
- The question of trust in institutions has also been highlighted in other research. Commentators have identified a similar tendency in the media to exaggerate and seek to mobilise opinion against a "supposed threat" or conspiracy.[38] In contrast, where previous research has placed clinicians - family doctors in particular - high in the hierarchy of public trust,[22, 39] this study found no evidence of positive reporting of the medical profession in relation to statins.

One question arising from this study is whether statins have a distinct status with respect to the debate. The polarisation of good drug/bad drug is not new. Other studies have reported a similarly dichotomised approach in relation to other medical treatments.[40, 23] There are parallels with the representation of the diagnosis and treatment of hypertension, another frequently invisible "sickness" addressed by long term, preventative medication.[16] However in the case of

statins, the threshold for treatment appears increasingly to be driven by age rather than specific clinical indicators. (The QRisk cardiovascular risk calculator is strongly influenced by age.) Everyone could eventually become a candidate for medicalisation, however healthy their lifestyle and however low their cholesterol ratio.

The study highlights a fundamental point concerning the significance of the portrayal of medical issues in the media: is it important that even someone reading across the whole range of newspaper coverage sampled for this study would receive a negative impression of the value of the scientific evidence, and the benefit of statins, when current clinical guidance recommends their use? Coverage in the popular press highlights the confusing messages projected by science and research worldwide. There is no mediating discourse leading people through the pendulum findings of one study or learned commentator after another. The “noise” of the continuing debate may even be frightening people away from taking their prescribed medications, and increasing cardiovascular mortality.[17, 29] This raises an ethical question around the desirability of presenting all viewpoints, however well or ill-evidenced, at the risk of deterring people from acting responsibly with regard to their health. Other studies have suggested there is scope for the scientific and medical worlds to articulate their messages more carefully for popular media consumption.[40, 41, 27] Alternatively, the rawness and transparency of the debate may be a good thing. The ability to see and critique another scientist’s work is valued by researchers, and it may also be of benefit to a non-medical audience to hear the challenge and defence of each viewpoint played out in the public arena. One response is for subject experts to

provide an evidence-based commentary on scientific issues of public interest, along the lines of NHS Choices' "Behind the Headlines", developed by Sir Muir Gray because "In the same way that people need clean, clear water, they have a right to clean, clear knowledge".[42]

This study adds insight into the portrayal of preventative medications, and related clinical policy, in the media. There are potential implications for clinicians, study authors, policy makers and public health practitioners. By increasing awareness of the messages their patients, readers and the public are predominantly hearing in relation to their medications, it highlights the considerable scope for all health experts to promote a more media-friendly, evidence-based narrative on health topics of public interest or concern.

Recommendations for further research include a comparison of a wider number of outlets and different areas of medicine over a longer period of time, a comparison of the medical and popular media coverage in detail, and further exploration of the impact of media coverage on reader health behaviours.

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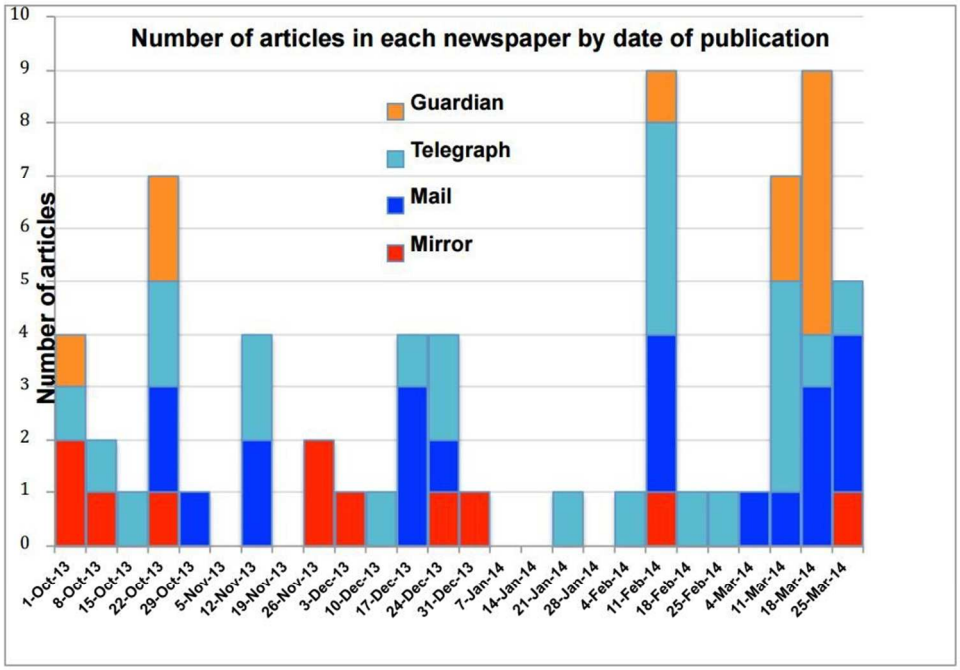

Figure 1

86x61mm (300 x 300 DPI)

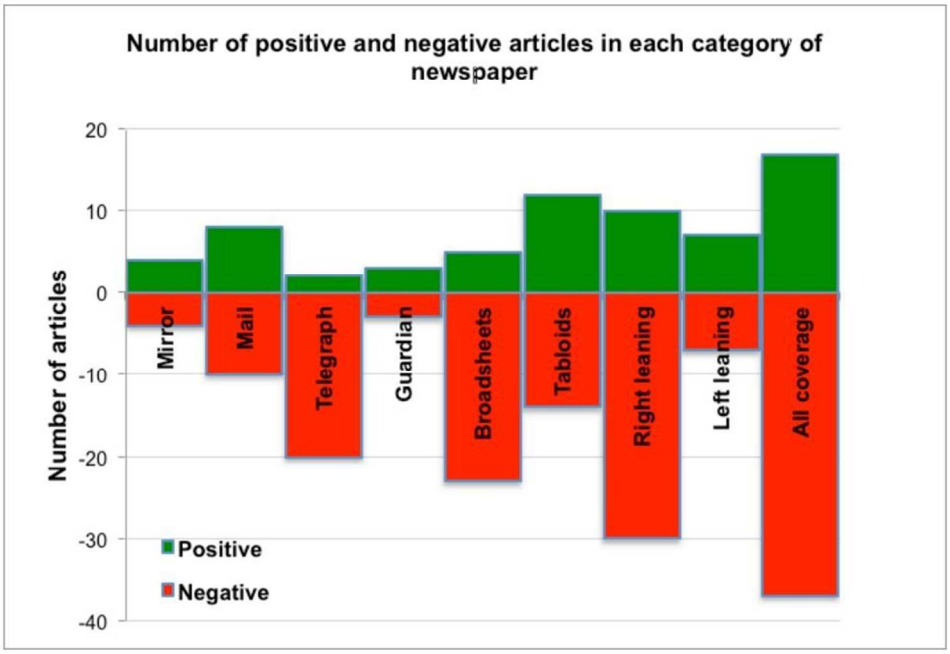

Figure 2

87x59mm (300 x 300 DPI)

DESCRIPTIVE AND ANALYTICAL CODING SCHEME

General descriptors

- unique article reference number
- date
- publication/outlet
- type of article
  - news report
  - report of published/planned study
  - personal interest story
  - comment
  - dear doctor column/Q&A
  - other (specify)
- headline (write in full)
- sub-headline (write in full)
- reference to statins
  - main subject
  - secondary subject (eg. in article on heart disease or lifestyle measures)
  - passing comment
- pictures/images – brief description eg. older woman in hospital bed wearing gown & taking blue tablets from a cup; red tablets scattered on a blue background
- author

- name
- title (eg. Chief health correspondent; doctor; ‘celebrity’ columnist)

- contributors/sources quoted
  - name
  - organisation/designation (eg. British Heart Foundation; King’s College London; NICE; BMJ editor; lay commentator)
    - medical ‘experts’
    - study authors
    - lay/public individuals or bodies
    - charities/support groups

- treatment of statins overall
  - positive
  - negative
  - neutral
  - not categorisable

- examples of positive/negative language
  - mention of harms, risks, side-effects
  - mention of benefits, positive collateral impact
    - eg. ‘few argue over effectiveness of statins for secondary prevention’; ‘statins help reduce signs of dementia by almost a third’
    - ‘significant risk of side-effects’; ‘never prescribe a statin for a loved one’

- apparent purpose of the article
  - eg. reporting publication of new guidance
  - responding to publication of a new study

- reporting patient experience
- responding to reader letter
- reporting prominent medical debate in the BMJ/Lancet

Constructed themes and suggested indicators

Theme	Example constructs
Medicalisation	Medicalising the healthy population
	Over-medication
	Over-treatment
	Giving tablets instead of modifying lifestyles
Lifestyle	Advocacy of lifestyle changes
	Diet
	Exercise
	Smoking
	Fats & cholesterol
Responsibility	Taking tablets mean people don't think they need to change their habits
	GPs should be addressing lifestyle factors
Side-effects of treatment	Muscular pain, weakness, myalgia, arthralgia, sleeping, not sleeping, diabetes, etc.
	Adverse effects
	Side-effects
	Negative impacts of statins
Collateral benefits	Statins improving other conditions eg multiple sclerosis

Evidence/effectiveness of treatment	Statins are in/effective
	Statins work by
	The evidence shows
	Statins halve the incidence of
	Studies show statin efficacy
	Effectiveness in primary prevention
	Effectiveness in secondary prevention
Confounding factors	It is not the statin, it is…
	Reducing smoking, not statins, has had an effect…
Scientific explanation	Statins operate by tackling reducing the enzymes that encourage production of LD cholesterol…
	Anti-inflammatory properties of statins…
	Side-effects are caused by the over-production of…
(Dis)trust	Doctors are paid by the number of people they identify/number of prescriptions…
	Studies are pharmaceutically sponsored…
	Government is motivated by…
	NICE has a duty to provide objective guidance…
Costs, value	Statins only cost 12p per day
	Prescriptions are increasing as statins come off patent
	The costs of surgery vs. drugs
Personal experience	My doctor recommended…
	I suffered side-effects from…
	I was on statins for 5 years…
	We and our patients know that…

	As a doctor…
	As a patient…
Patient/user choice/autonomy	Patients should have a choice
	Patients should check with their doctor
	Statins are not mandatory
	No-one is forced to take a statin
	Patients need to weigh up the pros and cons
Information for decision-making	Information for patients
	Patients need to make informed decisions
	Patients are confused by the messages they receive
	It is important to give clear information
Age, gender	More men than women/vice versa
	Everyone over 50/65/75/85
	Evidence is lower for those over 75
Pharmaceutical companies	Pharma
	Sponsorship of trials
	Sponsorship of individuals
	Influence on individuals, institutions, national bodies, politics
Reader response	Where quoted – letters, emails, follow up trails
Trends	Over the last ten years…
International comparisons	The UK is the statins capital of Europe…
	UK vs. US/Europe/Australasia

BMJ Open

A CONTENT ANALYSIS OF THE REPRESENTATION OF STATINS IN THE BRITISH NEWSPRINT MEDIA

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A CONTENT ANALYSIS OF THE REPRESENTATION OF STATINS IN THE BRITISH NEWSPRINT MEDIA

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Tables and graphs: 2 tables, 2 graphs

ABSTRACT

Objective

This study reviewed the news media coverage of statins, seeking to identify specific trends or differences in viewpoint between media outlets and examine common themes.

Design

The study is a content analysis of the frequency and content of the reporting of statins in a selection of the British newsprint media. It involved an assessment of the number, timing and thematic content of articles followed by a discourse analysis examining the underlying narratives. The sample was the output of four UK newspapers, covering a broad-spectrum readership, over a six month timeframe 1 October 2013 - 31 March 2014.

Results

A total of 67 articles included reference to statins. The majority (39, 58%) were reporting or responding to publication of a clinical study. The ratio of negative to positive coverage was greater than 2:1 overall. In the more politically right-leaning newspapers, 67% of coverage was predominantly negative (30/45 articles); 32% in the more left-leaning papers (7/22 articles). Common themes were:

- the perceived ‘medicalisation’ of the population;

- the balance between lifestyle modification and medical treatments in the primary prevention of heart disease;
- side effects and effectiveness of statins;
- pharmaceutical sponsorship, and implications for the reliability of evidence;
- trust between the public and government, institutions, research organisations and the medical profession.

Conclusions

Newsprint media coverage of statins was substantially influenced by the publication of national guidance and by coverage in the medical journals of clinical studies and comment. Statins received a predominantly negative portrayal, notably in the more right-leaning press. There were shared themes: concern about the balance between medication and lifestyle change in the primary prevention of heart disease; the adverse effects of treatment; and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

Strengths and limitations of this study

- The use of media websites for data collection may have excluded some material which was only available in the print versions, and conversely included some material not available in print.

- The pragmatic selection of the study timescale and media selection may have reduced the representativeness and therefore generalisability of the study; however, the sampling strategy was designed to ensure that the sources represented a reasonable range and diversity of the established newspaper media.
- There was a single researcher and not a research team, leading to a potential risk of bias or incompleteness in the identification and selection of articles, and no inter-rater reliability checking of the coding scheme, which may have an impact on the validity of the analyses.
- Blinding was not strictly possible, but articles were coded by a unique numerical identifier to reduce bias during the thematic analysis and an inductive approach was applied to ensure that the themes were dictated by the evidence emerging from the texts and not imposed by the researcher.

INTRODUCTION

UK clinical guidelines recommend the use of lipid lowering therapy for both secondary and primary prevention.[1, 2] This is based on published clinical trial evidence of effectiveness, cost-effectiveness,[1, 3-8] and the extent of side-effects.[7-9] There is debate in the clinical literature about the merits of the widespread and growing use of statins, questioning whether the 'right' patients are benefiting, whether the threshold for initiation of primary preventative treatment is too low, and the reliability of the evidence underpinning the guidelines.[10-16] The same issues are also covered in the lay media, where, however, the nature and extent of the debate is less well documented.

There is an interaction between the lay and clinical media, with the same commentators and topics or reported, or directly speaking, in both,[17-21] And importantly, there is evidence that the lay media influences health-related perceptions and behaviours, including reporting of side-effects, uptake of services and adherence to medication.[22-27] The Chief Medical Officer for England has called for a review into how the safety and efficacy of drugs is judged, prompted by concern about the representation of statins and other drugs "in both the medical and general press".[28] A recent Danish study, using national and regional media coverage as a proxy for individual exposure, found that negative statin-related news stories were associated with both early statin discontinuation and cardiovascular mortality.[29]

In the light of this relationship, it is relevant to examine the portrayal of statins in the media, and the messages that are being predominantly received. This study

investigates the nature of the representation of statins in the newsprint media, identifying the key themes, trends, characteristics and viewpoints.

METHOD

A descriptive and thematic analysis of the frequency of the coverage of statins in the UK newsprint media was undertaken. Media were selected with the aim of obtaining broad spectrum coverage reflecting a range of editorial leanings and readerships. An initial screening sample was undertaken in order to pilot the methodology and to consolidate the questions and sampling strategy for the main research.[30] This identified what would be practical for one researcher to collect, and enabled refinement of the range and type of outlets, the time period and the type of articles for inclusion in the main data collection. The sampling frame selected for the main study was the UK newsprint media. A purposive sampling strategy was followed, with newspapers selected on the basis that they were accessible, able to be searched and analysed by one researcher in the time available, and demographically, geographically and politically representative of a broad spectrum readership. The selected newspapers were The Daily Mail, The Daily Mirror, The Telegraph and The Guardian (**Table 1**). These are all national UK newspapers, recording the highest circulation[1].

[1] The Sun recorded the highest circulation but The Sun and The Times were excluded because they did not have free to access websites.

Table 1 Readership of selected newspapers 2013[31, 32]

Category	Daily Mail	Daily Mirror	The Telegraph	The Guardian
Circulation	1,863,000	1,058,500	555,600	204,400
Average age	58	Not given	61	44
Readership 65+	45%	34%	46%	21%
Gender	51% female	54% male	52% male	52% male
Social class ABC1[2]	64%	43%	87%	89%
Predominant geography [Mori 2005]	83% outside London & Scotland	North	East & South East	London
Predominant political stance[3]	Right	Left	Centre right	Centre left
Market designation	Tabloid	Tabloid	Broadsheet	Broadsheet

Full texts of articles were searched by keyword and collected retrospectively from the websites of the selected media outlets over a continuous six month timeframe (1 October 2013 to 31 March 2014). The main search term was “statin” (“statins” did not retrieve all mentions.) A further search on “cholesterol”, “cardiovascular” and “heart disease” was undertaken to confirm all relevant articles had been captured. All articles with any recorded mention of statins were screened. All types of article were included.

Articles were downloaded and printed in full. Each article was given a unique reference number, to blind the researcher to source during the analysis, and key descriptors were recorded. A thematic data analysis was then undertaken. A coding scheme provided a consistent framework for data collection and analysis

[2] Social gradings A-E are based on 2011 UK census data. ABC1 represents higher & intermediate to clerical and junior occupations.

[3] Political stance reflects party affiliation in the most recent general election. (Right: Conservative, UKIP; left: Labour, Green; Centre right: Conservative, Liberal Democrat; Centre left: Labour, Liberal Democrat.)

and enabled independent third party review. The exclusion criterion was peripheral mention of statins with no associated reporting or comment.

The analysis was in two parts. An initial descriptive analysis mapped the findings against the descriptive indicators, including whether the coverage was judged to be predominantly positive or negative in terms of the arguments, language, and terminology. Where the proportion of positive and negative comments appeared similar, or where it was difficult to decide on the overall direction, a neutral assessment was given. A more detailed qualitative analysis then examined the nature of the discourses within the key themes, including viewpoints, assumptions and language. Outlets were then tracked back and identified in the results. A copy of the coding scheme is available as a supplementary document.

There were no confidentiality issues associated with the study as all data sources were within the public domain. Ethics Committee approval was not required.

RESULTS

Searches identified 67 articles during the time period. A timeline showing overage by outlet by week is shown in **Figure 1**. There is considerable variation, with peaks in coverage weeks commencing 11 February and 18 March. The NICE revised draft guidelines were published on 12 February,[33] covered in 11 articles, prompting the earlier peak. A systematic review of the side-effects of statins[9] was widely reported a month later. In only five of the 26 weeks was there no story about statins.

Figure 1 Coverage by outlet by week, October 2013 – March 2014

In two thirds of articles **(Table 2)**, statins were the main topic. The majority of articles (39, 58%) were reporting or responding to publication of a clinical study.

Table 2 Number, stance, and theme of articles mentioning statins 1 October 2013 – 31 March 2014

		Telegraph	Daily Mail	Guardian	Daily Mirror	Total
Number of articles		25	20	11	11*	67
Frequency of article type	Study report/ response	10 (40%)	13 (65%)	6 (55%)	10 (91%)	39 (58%)
	Commentary	3 (12%)	1 (5%)	2 (18%)	0 (0%)	6 (9%)
	Q&A	2 (8%)	1 (5%)	0 (0%)	0 (0%)	3 (4%)
	Personal story	1 (4%)	1 (5%)	1 (9%)	0 (0%)	3 (4%)
	News report	1** (4%)	1** (5%)	0 (0%)	1** (8%)	3 (4%)
	Letters	4 (16%)	0 (0%)	0 (0%)	0 (0%)	4 (6%)
	Expert/'celebrity' commentator	3 (12%)	2 (10%)	0 (0%)	0 (8%)	5 (7%)
	Other	1 (4%)	1 (5%)	2 (18%)	0 (0%)	4 (6%)
Statins main topic	Main topic	18 (72%)	14 (70%)	10 (91%)	3 (25%)	45 (67%)
	Secondary topic	7 (28%)	6 (30%)	1 (9%)	8 (67%)	22 (33%)

* One article was excluded.
** Publication of NICE and US guidelines on the use of statins

The ratio of negative to positive coverage was greater than 2:1 overall. The more right-leaning papers exhibited a ratio of 3:1 negative to positive articles, where the left leaning press had equal proportions of each. The Telegraph had the highest differential with a 10:1 ratio of negative to positive stories **(Figure 2)**. Articles on studies reporting collateral benefits (statins benefiting people with multiple sclerosis or dementia for example) were more likely to portray statins in a positive light.

Figure 2 Positive and negative coverage[4]

[4] The Guardian and Telegraph are categorised as broadsheet, The Mail and Mirror as tabloid; The Telegraph and Mail are categorised as right leaning, The Guardian and Mirror as left leaning.

Thematic analysis

The themes with the highest number of mentions selected for detailed analysis were: medicalisation versus lifestyle modification; the effectiveness of statins in the light of their side-effects; and trust of those advocating statin therapy.

Medicalisation versus lifestyle modification

The term "medicalisation" is used by three of the four sampled media, both in quotes from contributors and by the article authors. In most cases it is used to denote the introduction of drug treatment for use in an otherwise apparently healthy population. It is used with an exclusively negative meaning:

> *"the "medicalisation" of people who are not ill… turning five million middle-aged and predominantly healthy men and women into statin-popping patients."* [Mail, 13/2/14]

> *"It is a concern to have to mass medicalise the whole of the British public in this way"* [Telegraph, 11/2/14] Britain will be confirmed *"the statins capital of Europe"* [Mail, 12/2/14]

There is a language of passivity and control. People are "medicalised", "medicated" or "*put on* statins" (emphasis added).

The majority of articles appear supportive of prescribing statins for those with established heart disease. The controversy centres on what proportion of those with risk factors for cardiovascular disease should receive statins as a primary preventative measure:

> *"there are people who may be overweight or have raised blood pressure. They probably don't have symptoms. They are not ill"* [Guardian, 21/3/14]

> *"we'll be medicalising many relatively healthy patients"* [Mail, 12/2/14] (emphasis added)

The medical profession is seen to be focusing on the medical option in preference to promoting lifestyle change:

> "[It is] *"simpler to reach for the pad and write out a prescription" than to dole out lifestyle advice"* [National Obesity Forum quoted in Mail and Telegraph, 25/12/13]

The public is also indicated to be at fault:

> *"There is a tendency… for patients (and doctors) to think that as long as they're on statins, smoking or a poor diet doesn't really matter";*
> *"people will see them as a magic pill that allows them to tuck into three pizzas a night and umpteen hamburgers with impunity"* ["leading

cardiologist" quoted in Mail, 8/3/14, 13/2/14]

Lifestyle measures could actually be the preferable medicine:

"Exercise can be just as efficient as drugs in treating heart disease" [study report, Mirror, 2/10/13]

"eating an apple a day is as effective as taking statins" [medical "campaigner", Telegraph, 2/3/14]

Effectiveness and side-effects of treatment

The positioning of "expert" opinion is important here. Who is most qualified to determine the impact of side-effects: clinician, trialist or patient?

Evidence from published studies on the extent of side-effects is reported:

"the benefits of statins greatly exceed any side effects" [Cholesterol trialists study report, Mail, 12/2/14].

This is directly challenged by individuals:

NICE "will tell you that… one in 10,000 patients… will suffer severe muscular

pain…. In contrast, reliable data from the real world… backed up by anecdotal evidence from my experience as a cardiac physician, suggests that the real figure… is closer to one in five.' [cardiologist quoted in Mail, 13/2/14]

"I know of only three people who have been on statins – I am one of them – and we all experienced debilitating muscle aches" [reader correspondence, Telegraph, 15/3/14]

The "noise" about side-effects may produce the equivalent of a *"nocebo effect"*:

"If we tell people about side effects,… we induce these unpleasant symptoms,… inflicting harm on our patients"; "We… shouldn't scare people into experiencing side effects… or into avoiding a medication which might help them" ["study author", Guardian, 14/3/14]

Statins are portrayed as either villain or hero:

"in years to come, statins could be seen as being as dangerous as thalidomide" [reader correspondence, Mail, 14/11/13]

"Statins may reduce dementia by a third" [study report, Telegraph, 30/12/13]

Over the six month sample period, statins were associated with potential beneficial effects on dementia, multiple sclerosis and erectile dysfunction.

Trust

A related but distinct theme is trust. The reliability of studies or guidelines is traditionally linked to the weight of scientific evidence – usually RCT evidence - underpinning them. However there is an implied suspicion of the evidence based on the perceived trustworthiness of those producing or funding it. An interesting question emerges concerning which forms of evidence have the greater validity:

> NICE recommendations for lowering the threshold for statin treatment are: *"based on solid evidence and the public should trust them"* [US study authors quoted in Mail, 13/11/13]
>
> *"The drug companies were saying this drug was the best thing since sliced bread"; "their findings are contradicted by independent surveys"* and they are *"contrary to the experience of many Telegraph readers"* [response to draft NICE guidelines, Telegraph, 2/3/14]
>
> *"trials run by the drug companies… are likely to be excessively favourable"* [Harvard clinician, Mail, 24/12/13]
>
> these same trials are refuted by *"anecdotal accounts… real world data... [and] my experience as a cardiac physician"* [cardiologist, Mail, 13/2/14]

The confidentiality of some of the trial data leads to suspicion of what the data

contain:

> There is no reason *"to accept the analysis of the Oxford team who have seen the data at face value just because they are big and important and professors at Oxford University… . Either they don't have a vast chunk of data or they do and they are not publishing it"* ["Scottish GP and author", Guardian, 21/3/14]

Another dimension of trust is seen in the portrayal of organisations and institutions. Pharmaceutical companies are almost universally negatively portrayed. Some academic bodies are still largely to be trusted, for example *"the respected Cochrane group"* [Guardian], but other organisations or individuals are contaminated by association:

> there are *"arrangements between Big Pharma and academic institutions [and] vested interests in the research"* [Telegraph, 15/3/14]

Political and administrative organisations receive a mixed portrayal:

> *"the government's advice is based on a wealth of evidence. The BMJ article is based on opinion"* [Public Health England director quoted in Guardian, 23/10/13]

> *"how can we explain this big gap between… personal experience… of doctors and patients… and official bodies such as NICE?"* [Mail, 18/3/14]

"*NICE seems to be siding firmly with the drug companies and relying on industry-sponsored statistics"* [Mail, 13/2/14]

Family doctors receive consistently negative coverage. Medical authority is portrayed as siding with, or indirectly influenced by, the pharmaceutically sponsored institutions. Doctors are accused of *"inexcusable deviousness"* in their methods for fulfilling screening quotas and in disguising a prescription for statins as *"lipid tablets"* [Telegraph, 16/2/14]. There is a risk of:

"more aggressive prescribing of the [statin] medications by family doctors, whose pay is linked to take-up of the pills among their patients" [Telegraph, 11/2/14].

DISCUSSION

This study found that the newsprint media coverage of statins was substantially influenced by coverage in the medical journals of clinical studies, reports and comment. Statins received a predominantly negative portrayal overall, notably in the more right-leaning press. Specifically, there was considerable coverage of reported side-effects, concern about the balance between medication and lifestyle changes in primary prevention, and a questioning of the reliability of evidence from research institutions, scientists and clinicians in the light of their potential allegiances and funding.

The findings are consistent with some other studies and also highlight some departures from previous research.

- The strongest criticism of statins and their effects in the media appears to reflect very closely the arguments presented in the medical journals over the same time period, although the weighting of the arguments may differ.[10-12] In the popular press there is no discernible difference in the reporting of what the scientific community might describe as important, high quality studies compared with the reporting of small studies, or opinion, with high potential for bias. All views are portrayed with equal weight and seriousness. Other studies have identified greater selectivity in reporting in the popular compared with the specialist media, with a greater focus on more controversial topics.[34]
- A notable trend I identified in the media is for reports of new links between, for example, statins and dementia, or statins and impotence, to be more

uncritical than reports of the use of statins in preventing heart disease. With a new study, the results themselves are the story, whereas with the role of statins in the prevention of heart disease, it is the debate and controversy that is represented.

- In terms of the medication versus lifestyle debate, clinical studies disagree about the extent to which health promoting behaviours are actually affected by long term statin use.[35-37] However the newspaper coverage contained a largely judgmental vocabulary around the selection of a medical treatment pathway, suggesting that people who take tablets, or doctors who prescribe them, may be abdicating personal responsibility for health.
- The question of trust in institutions has also been highlighted in other research. Commentators have identified a similar tendency in the media to exaggerate and seek to mobilise opinion against a "supposed threat" or conspiracy.[38] In contrast, where previous research has placed clinicians - family doctors in particular - high in the hierarchy of public trust,[22, 39] this study found no evidence of positive reporting of the medical profession in relation to statins.

One question arising from this study is whether statins have a distinct status with respect to the debate. The polarisation of good drug/bad drug is not new. Other studies have reported a similarly dichotomised approach in relation to other medical treatments.[40, 23] There are parallels with the representation of the diagnosis and treatment of hypertension, another frequently invisible "sickness" addressed by long term, preventative medication.[16] However in the case of statins, the threshold for treatment appears increasingly to be driven by age rather

than specific clinical indicators. (The QRisk cardiovascular risk calculator is strongly influenced by age.) Everyone could eventually become a candidate for medicalisation, however healthy their lifestyle and however low their cholesterol ratio.

The study highlights a fundamental point concerning the significance of the portrayal of medical issues in the media: is it important that even someone reading across the whole range of newspaper coverage sampled for this study would receive a negative impression of the value of the scientific evidence, and the benefit of statins, when current clinical guidance recommends their use? Coverage in the popular press highlights the confusing messages projected by science and research worldwide. There is no mediating discourse leading people through the pendulum findings of one study or learned commentator after another. The "noise" of the continuing debate may even be frightening people away from taking their prescribed medications, and increasing cardiovascular mortality.[17, 29] This raises an ethical question around the desirability of presenting all viewpoints, however well or ill-evidenced, at the risk of deterring people from acting responsibly with regard to their health. Other studies have suggested there is scope for the scientific and medical worlds to articulate their messages more carefully for popular media consumption.[40, 41, 27] Alternatively, the rawness and transparency of the debate may be a good thing. The ability to see and critique another scientist's work is valued by researchers, and it may also be of benefit to a non-medical audience to hear the challenge and defence of each viewpoint played out in the public arena. One response is for subject experts to provide an evidence-based commentary on scientific issues of public interest,

along the lines of NHS Choices' "Behind the Headlines", developed by Sir Muir Gray because "In the same way that people need clean, clear water, they have a right to clean, clear knowledge".[42]

This study adds insight into the portrayal of preventative medications, and related clinical policy, in the media. There are potential implications for clinicians, study authors, policy makers and public health practitioners. By increasing awareness of the messages their patients, readers and the public are predominantly hearing in relation to their medications, it highlights the considerable scope for all health experts to promote a more media-friendly, evidence-based narrative on health topics of public interest or concern.

Recommendations for further research include a comparison of a wider number of outlets and different areas of medicine over a longer period of time, a comparison of the medical and popular media coverage in detail, and further exploration of the impact of media coverage on reader health behaviours.

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Transparency declaration: The manuscript is an honest, accurate and transparent account of the study reported. No important aspects have been omitted.

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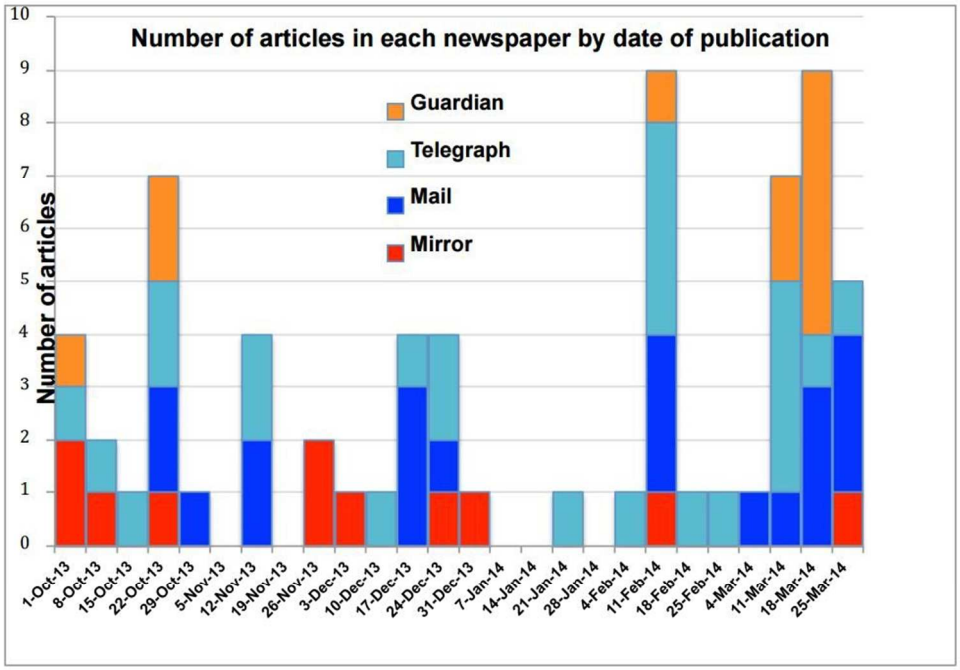

Figure 1

86x61mm (300 x 300 DPI)

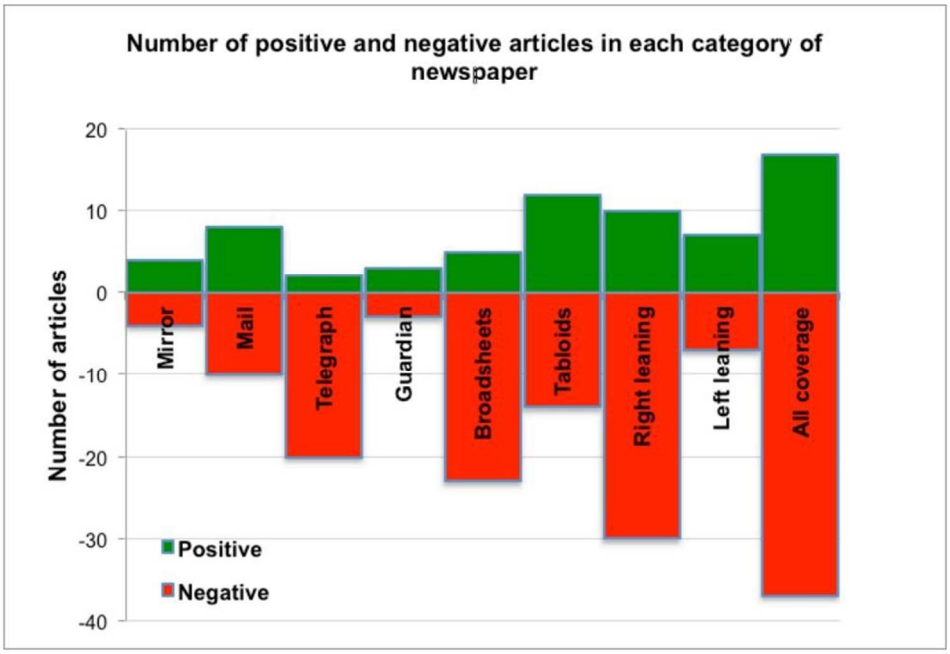

Figure 2

87x59mm (300 x 300 DPI)

DESCRIPTIVE AND ANALYTICAL CODING SCHEME

General descriptors

- unique article reference number
- date
- publication/outlet
- type of article
  - news report
  - report of published/planned study
  - personal interest story
  - comment
  - dear doctor column/Q&A
  - other (specify)
- headline (write in full)
- sub-headline (write in full)
- reference to statins
  - main subject
  - secondary subject (eg. in article on heart disease or lifestyle measures)
  - passing comment
- pictures/images – brief description eg. older woman in hospital bed wearing gown & taking blue tablets from a cup; red tablets scattered on a blue background
- author

- name
- title (eg. Chief health correspondent; doctor; ‘celebrity’ columnist)

- contributors/sources quoted
  - name
  - organisation/designation (eg. British Heart Foundation; King’s College London; NICE; BMJ editor; lay commentator)
    - medical ‘experts’
    - study authors
    - lay/public individuals or bodies
    - charities/support groups

- treatment of statins overall
  - positive
  - negative
  - neutral
  - not categorisable

- examples of positive/negative language
  - mention of harms, risks, side-effects
  - mention of benefits, positive collateral impact
    - eg. ‘few argue over effectiveness of statins for secondary prevention’; ‘statins help reduce signs of dementia by almost a third’
    - ‘significant risk of side-effects’; ‘never prescribe a statin for a loved one’

- apparent purpose of the article
  - eg. reporting publication of new guidance
  - responding to publication of a new study

- reporting patient experience
- responding to reader letter
- reporting prominent medical debate in the BMJ/Lancet

Constructed themes and suggested indicators

Theme	Example constructs
Medicalisation	Medicalising the healthy population
	Over-medication
	Over-treatment
	Giving tablets instead of modifying lifestyles
Lifestyle	Advocacy of lifestyle changes
	Diet
	Exercise
	Smoking
	Fats & cholesterol
Responsibility	Taking tablets mean people don't think they need to change their habits
	GPs should be addressing lifestyle factors
Side-effects of treatment	Muscular pain, weakness, myalgia, arthralgia, sleeping, not sleeping, diabetes, etc.
	Adverse effects
	Side-effects
	Negative impacts of statins
Collateral benefits	Statins improving other conditions eg multiple sclerosis

Evidence/effectiveness of treatment	Statins are in/effective
	Statins work by
	The evidence shows
	Statins halve the incidence of
	Studies show statin efficacy
	Effectiveness in primary prevention
	Effectiveness in secondary prevention
Confounding factors	It is not the statin, it is…
	Reducing smoking, not statins, has had an effect…
Scientific explanation	Statins operate by tackling reducing the enzymes that encourage production of LD cholesterol…
	Anti-inflammatory properties of statins…
	Side-effects are caused by the over-production of…
(Dis)trust	Doctors are paid by the number of people they identify/number of prescriptions…
	Studies are pharmaceutically sponsored…
	Government is motivated by…
	NICE has a duty to provide objective guidance…
Costs, value	Statins only cost 12p per day
	Prescriptions are increasing as statins come off patent
	The costs of surgery vs. drugs
Personal experience	My doctor recommended…
	I suffered side-effects from…
	I was on statins for 5 years…
	We and our patients know that…

	As a doctor…
	As a patient…
Patient/user choice/autonomy	Patients should have a choice
	Patients should check with their doctor
	Statins are not mandatory
	No-one is forced to take a statin
	Patients need to weigh up the pros and cons
Information for decision-making	Information for patients
	Patients need to make informed decisions
	Patients are confused by the messages they receive
	It is important to give clear information
Age, gender	More men than women/vice versa
	Everyone over 50/65/75/85
	Evidence is lower for those over 75
Pharmaceutical companies	Pharma
	Sponsorship of trials
	Sponsorship of individuals
	Influence on individuals, institutions, national bodies, politics
Reader response	Where quoted – letters, emails, follow up trails
Trends	Over the last ten years…
International comparisons	The UK is the statins capital of Europe…
	UK vs. US/Europe/Australasia