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Making news about medicines

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

1995

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Trigt, A. M. V. (1995). *Making news about medicines*. s.n.

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SETTING THE AGENDA

DOES THE MEDICAL LITERATURE SET THE AGENDA FOR ARTICLES ABOUT MEDICINES IN THE NEWSPAPERS?¹

Abstract

The source of ideas and information on medicines most important to journalists in the Netherlands, and most commonly consulted by them, is known to be the scientific medical literature. In this chapter we therefore, explored the relation between the kind of medicines discussed in the scientific medical literature and those discussed in newspapers. A content analysis of scientific medical journals was combined with a content analysis of Dutch daily newspapers. The results show an agreement in the main groups of medicines discussed in the scientific medical literature and newspapers. In both the newspapers and the professional journals anti-infective medication and drugs for the central nervous system are the groups of medicines most frequently discussed. Although it has been suggested that "bad news" is more newsworthy than "good news", the negative consequences of the use of medicines received proportionally more attention in the professional literature than in the newspapers.

1 Social Science & Medicine (in press)

3.1

Introduction

For most people the reality of science is what they read in the press [1]. That "reality" may or may not be in accordance with the actual facts; one of the concerns within the scientific community seems to be that science reporting in the mass media does not portray the reality of scientific research or of current developments and concerns in the scientific community. Some topics are overemphasized, while others receive no media attention at all. In newspapers science news is dominated by news about medicine [2-4]. Critics argue that sometimes reports in the newspapers about new treatments raise false hopes. Too often health news is unbalanced by overly optimistic reports of miracle medical technology while little or no attention is devoted to the costs, complications and problems of access of new modes of health care [5-6]. Some diseases receive proportionally more media coverage than others, although they may be rare and have a low(er) incidence [7-8]. Such media reporting may even influence the funding of research projects. Some people argue that because AIDS received much attention in the media, cancer related research received less financial support than it might otherwise have done [9].

Journalists themselves obviously decide what is written about science and medicine in the newspapers and which topics receive particularly emphasis. However, science journalists receive a vast amount of information which is provided spontaneously by others, for example in the form of press releases. They also consult their own sources in making choice of material. The nature of the sources which journalists themselves consult can however itself have a considerable influence on what is to become news; one topic may for example be so prominent in the source material that it is unlikely to be ignored, while another may be hidden unless one digs assiduously to find it. It is from all this information, provided by others or deliberately hunted down, that journalists select their topics, set their priorities and acquire their specific facts.

The source of ideas and information most important to medical journalists¹ in the Netherlands, and most commonly consulted by them, is known to be the scientific medical literature [10]. Journalists are known to select topics from the journals they read using the following criteria: the scientific relevance of the topic, the number of people likely to be personally affected by the topic, their own interest, and the topicality of the subject [11]. It is reasonable

1 These medical journalists are specialized science journalists

to hypothesize that the scientific relevance of a topic perceived by a journalist increases with the number of publications devoted to that subject in the scientific medical literature. One would then expect to find that there is, by and large, a parallel between emphasis devoted to particular matters in the scientific medical literature and the emphasis which these topics receive in the newspapers. In other words, we might well expect the scientific medical literature to set the agenda for the newspapers.

Agenda-setting research was originally focused on the public agenda and assumed a relation between the mass media agenda and the public agenda. According to McCombs, one of the earliest contributors to the field of agenda-setting, in the 1980s, the original question "Who sets the public agenda?" was rephrased into "Who sets the news agenda?". Agenda-setting research transformed the news agenda from an independent variable to a dependent variable [12] (see figure 1).



Figure 1
The relation between the scientific agenda, the newspaper agenda and the public agenda

In this study, which focused on medicines, we look at the newspaper agenda as dependent variable and investigated to what extent it is determined by the scientific medical literature. In other words we focused on the agreement between medicines discussed in the scientific medical literature and the medicines discussed in the newspapers.

3.2

METHODS

The present investigation set out to determine if there is an agreement in the types of medicines discussed in the scientific and medical literature and those discussed in the newspapers. For this purpose, we conducted a content analyses of scientific and medical journals and of Dutch newspapers.

Scientific and medical literature

To determine which medicines were most often discussed in the scientific medical literature, the content of ten scientific and medical journals over a nine-months period (January - September 1991) was analysed. The following journals were included The New

England Journal of Medicine (NEJM), the Lancet, the British Medical Journal (BMJ), Science, Nature, and five Dutch medical and pharmaceutical journals. We selected these journals because Dutch journalists writing about medicines had indicated to us in an earlier phase of our research that these were the journals which they used to get ideas and information to write their stories [10].

For the journals included, all the tables of contents were screened for publications about medicines. In case of doubt whether or not the publication really referred to medicines, the abstract and/or first paragraph of the publication was read; if the publication was shorter than one page the whole publication was read. A publication was included in the analysis if a drug was mentioned in the title, abstract, first paragraph or somewhere in the publication if it was shorter than one page. All different types of publications in the journals were analyzed except for the book reviews, case histories, advertisements, and short abstracts. We also excluded publications relating to drug policy since Dutch medical journalists had already indicated to us that these was not a topic on which they themselves wrote; news items in this matter are written by other members of the newspaper's staff [10].

In the analysis the medication was categorized with the Anatomical, Therapeutical and Chemical classification system (ATC). This system has been commonly used in drug utilization studies in Europe. In the ATC classification every preparation is given a code number consisting of up to five elements [13]. For the present purpose three extra main groups were added to the original ATC: a group for articles dealing with medicines in general, a group for medicines not yet approved or with a indication not clear and a group for alternative medicines such as homeopathic drugs. A total of 17 main groups was used to classify the medicines.¹ Publications containing more than one drug from different ATC main groups were included in more than one ATC group.

The data were analyzed on the first and second level of the ATC classification system. To establish the agenda of the scientific and medical literature concerned with medicines, the 17 main groups of the ATC system (first level) were ranked according to their frequencies. For all analyses concerned with agenda's, the 17 main groups of the ATC system (first level) were used. The second level

1 Gastrointestinal drugs + vitamins, Bloodforming drugs, Cardiovascular drugs, Dermatologicals, Gynecological drugs, Hormones (excl gynecological drugs), Antibiotics, Oncolytics, Anti-inflammatory drugs, Central Nervous System drugs, Antiparasitic products, Respiratory drugs, Eye- and ear drugs, Various, Homeopathic drugs, Drugs in general, not yet available drugs.

of the ATC classification system was used for descriptive statistics only. A total of 89 different subclasses (second level) can be distinguished in the ATC system used.

To determine whether the literature agenda changed, insofar as medicines were concerned, during the nine month period the agenda's of the different months were compared by using Spearman's rank correlation (R_s) to study the agreement in the ranking of the 17 different categories. We also tested if the agenda of the research articles and editorials was comparable to the agenda of all other publications. Furthermore, we compared the agenda of the British / American journals with the agenda of the Dutch journals to see whether or not there is a difference in the medicines discussed. There was an agreement between two agenda's if $R_s > 0.485$ ($p < 0.05$, 17 categories).

Furthermore we differentiated between publications focused on the negative consequences of drug use and those publications more positive or neutral in tone and established a "good" and "bad news" agenda.

Newspapers

The newspaper agenda was determined by analyzing the content of five daily newspapers was analyzed over a period of four months (June - September 1991). All publications were selected in which medication of some sort was discussed, however, articles on drug policy, letters to the editor and articles directly adopted from the news agencies were excluded.

The newspapers were divided in two categories, national daily newspapers and regional daily newspapers. Within the category national newspapers, we subdivided papers in quality newspapers and popular newspapers [14]. One has to realize that in contrast to German or British newspapers, all Dutch dailies should be characterized as quality newspapers, since tabloids and their sensationalism do not exist in the Netherlands [15]. The circulation of the five dailies selected for our study accounts for 39% of the total circulation of Dutch daily newspapers [16].

The medication mentioned in the newspapers was classified according to the ATC classification system. To establish the agenda of the newspapers, just as in establishing the agenda of the literature, the 17 main ATC groups were ranked according to their frequency. Like for the literature a "good news" and a "bad news" agenda was also established.

Period of study.

The newspapers were analyzed during four months (June-September 1991). The scientific literature was studied during a period of nine months (January-September 1991). The scientific literature was analyzed longer than the newspapers for two reasons. First of all, the topics on the agenda of the scientific literature have to become prominent to the newspaper journalists, there might a time-lag before the effect of the agenda of the literature can be found in the newspapers. Journalists have to become aware of the topics. Secondly, the nine-months period was considered to be sufficient because in the newspaper articles only in one article a reference was made to a research article published in February 1991 in the scientific medical literature.

Comparison of the two agenda's

To compare the agenda of the scientific and medical literature with the agenda of the newspapers we used Spearman's rho (R_s) to study the agreement in the ranking of the 17 different categories. Furthermore, we compared the ten most frequently discussed subclasses in the scientific and medical journals with those of the newspapers.

To study whether or not there is a publication bias in the newspaper articles on medicines, the "bad news" agenda's and "good news" agenda's were compared.

3.3

RESULTS

Scientific medical literature

A total of 1574 publications about medicines was found in scientific medical literature in the period of nine months.

The largest contribution (62.7%) in the publications about medicines originated from the British/American medical journals (NEJM, BMJ, Lancet; see table 1). Nature and Science were responsible for 5.3% of the total number of medicines mentioned in the publications. The five Dutch journals provided for 27.6%. Letters to the editor was an important category within the journals to discuss medicines. Only 34 review articles discussing medicines were found during the nine-months period. If we compared the British/American medical journals, it is notable that the Lancet discussed medicines most often.

In the medical and scientific literature the categories "general anti-infectives" and "central nervous system" were mentioned most

Table 1

Type of publication per journal

	NEJM	Lancet	BMJ	Nature	Sci	Dutch	Total
article	65	105	76	1	4	97	348
editorial	27	28	40	-	1	70	166
letter	87	400	117	21	3	54	682
review	18	2	3	1	-	10	34
other	-	29	60	13	39	203	344
total	197	564	296	36	47	434	1574
	67.2%			5.3%		27.6%	

NEJM = New England Journal of Medicine, Lancet = The Lancet, BMJ = British Medical Journal, Nat = Nature, Sci = Science, Dutch = Dutch journals

Table 2

Scientific medical literature-agenda of medicines. (all journals and publication types included; n=1589). Within the main ATC groups the most important subclass(es) is (are) shown.

ATC main group	ATC subclass	ATC code	number of publications
General antiinfectives, systemic		J	327
	Systemic antibiotics	J01	71
	Virustatics, systemic	J05	73
	Immune sera and immunoglobulines	J06	61
	Vaccines	J07	73
Central nervous system		N	204
	Analgesics	N02	62
	Psycholeptics	N05	60
Blood and blood forming organs		B	164
	Anticoagulants	B01	57
	Antianaemic preparations	B03	37
	Plasma substitutes and perfusion solutions	B05	36
Antineoplastic/ immunosuppressive drugs		L	138
	Cytostatic drugs	L01	90
Alimentary tract and metabolism		A	125
	Antiacids, antifatulents, antipeptic ulcerants	A04	25
	Antidiarrhoeals, intestinal antiinflammatory, antiinfective agents	A07	27
Cardiovascular system		C	104
	Cardiac therapy	C01	37
	Hypotensives	C02	53
Genito urinary system and sex hormones		G	81
	Sex hormones and stimulants of the genital system	G03	62
Respiratory system		R	80
	Anti-asthmatics	R03	45
Drugs in general		Z	78
Systematic hormonal preparation, exc. sex hormones		H	64
	Systematic corticosteroids	H02	26
Musculo-skeletal system		M	43
	Antiinflammatory and antirheumatic drugs	M01	36
Dermatologicals		D	42
Antiparasitic drugs		P	42
	Antiprotozoals	P01	31
Homeopathic and alternative medicines		Y	36
Various		V	33
Not registered medicines		X	16
Sensory organs		S	12

often (see table 2). Within the category "general anti-infectives" the subclasses virustatics and vaccines were the most important ones.

To check if the agenda changed during the research period we compared the agenda's of the nine separate month with each other. The Spearman rank correlation ranged from 0.60 to 0.94, with an average of 0.83. In other words, the agenda of the scientific and medical literature did not change very much during the research period.

The agenda of the research articles and editorials was comparable to the agenda of all other publications ($R_s=0.96$, data not shown).

The agenda of the British/American medical journals correlated with the agenda of the Dutch journals ($R_s=0.76$, see table 3). In the Dutch journals drugs for the central nervous system were more frequently discussed than the general antiinfectives. Furthermore, the antineoplastic and immunosuppressive drugs dropped from the fourth position on the British/ American agenda to the eight position on the Dutch agenda (see table 3).

Of all the publications found, 26% focused on the negative consequences of drug-use, e.g. side effects, while the main theme of more than half of the publications (58%) could be characterized as positive or neutral in tone and content.

Table 3

Comparison of the agenda's of the British/American medical journals and the Dutch journals.

ATC main group	British and American journals*		Dutch journals	
	%	rank	%	rank
General antiinfectives (J)	21.2	1	11.7	2
Central nervous system (N)	12.4	2	14.7	1
Blood/bloodforming organs (B)	11.4	3	9.4	4
Antineoplastic/ immunosuppres. drugs (L)	9.7	4	5.0	8
Alimentary tract and metabolism (A)	7.2	5	9.4	4
Cardiovascular system (C)	6.1	6	8.5	6
Genito urinary syst. / sex hormones (G)	5.7	7	4.4	10.5
Respiratory system (R)	5.6	8	4.4	10.5
Drugs in general (Z)	3.3	10	9.4	4
Systemic hormonal preparations (H)	5.0	9	2.3	13.5
Musculo-skeletal system (M)	2.5	12	3.7	12
Dermatologicals (D)	1.9	14	5.0	8
Antiparasitic drugs (P)	2.9	11	2.3	13.5
Homeopathic and alternative medicines (Y)	1.3	15	5.0	8
Various (V)	2.2	13	2.1	15
Not registered medicines (X)	1.0	16	1.1	17
Sensory organs (S)	0.5	17	1.7	16

* NEJM, BMJ and Lancet; $R_s = 0.76$, $p < 0.01$

Newspapers

A total of 178 publications was found in the newspapers over a four-month period. More publications appeared in the two popular newspapers (n=91) than in the two quality newspapers (50 publications). In the regional paper 37 publications about medicines were found.

The most important categories of medicines discussed in the newspapers were the general anti-infectives, followed by medicines for the central nervous system and drugs in the category "Genito urinary system and sex hormones" (see table 4). Drugs in the category "sensory organs" were not mentioned in the newspapers.

The negative consequences or problems with medicines were discussed in 14% of all the publications in the newspapers. Approximately three quarter of the publications were classified as

Table 4
Newspaper agenda on medicines (n=187)

ATC main group	ATC subclass*	ATC code	number of publications
General antiinfectives, systemic		J	36
	Systemic antibiotics	J01	5
	Virustatics, systemic	J05	5
	Vaccines	J07	23
Central nervous system		N	25
	Analgesics	N02	10
	Psychoanaleptics	N06	6
Genito urinary system and sex hormones		G	25
	Sex hormones and stimulants of the genital system	G03	19
Blood and blood forming organs		B	19
	Anticoagulants	B01	5
	Antihaemorrhagics	B02	4
	Antilipaemics	B04	5
Drugs in general		Z	15
Homeopathic and alternative medicines		Y	13
Alimentary tract and metabolism		A	8
	Antidiabetic therapy	A10	4
Cardiovascular system		C	8
	Hypotensives	C02	6
Respiratory system		R	8
Various		V	7
Antineoplastic/immunosuppressive drugs		L	7
	Cytostatic drugs	L01	7
Not registered medicines		X	3
Antiparasitic drugs		P	3
Dermatologicals		D	3
Systematic hormonal preparation, exc. sex hormones		H	3
Musculo-skeletal system		M	2
Sensory organs		S	0

* Within the main ATC groups the most important subclass(es) is (are) shown

"good news" stories. There was no significant difference found for the different types of newspapers (Chi square, $p > 0.05$).

Comparison of the two agenda's

When we compare the agenda of the scientific and medical literature with the agenda of the newspaper we see that the two agenda's were correlating (see table 5). An interesting difference is that the drugs for the genito urinary tract and sex hormones were relatively more prominent in the newspapers; the same could be said of alternative medicines.

Table 5
Comparison of the two agenda's

ATC main group	scientific medical journals		newspapers	
	%	rank	%	rank
General antiinfectives (J)	20.6	1	19.2	1
Central nervous system (N)	12.8	2	13.4	2.5
Blood/bloodforming organs (B)	10.3	3	10.2	4
Antineoplastic/ immunosuppres. drugs (L)	8.7	4	3.7	10.5
Alimentary tract and metabolism (A)	7.9	5	4.3	8
Cardiovascular system (C)	6.5	6	4.3	8
Genito urinary syst. / sex hormones (G)	5.1	7	13.4	2.5
Respiratory system (R)	5.0	8	4.3	8
Drugs in general (Z)	4.9	9	8.0	5
Systemic hormonal preparations (H)	4.0	10	1.6	13.5
Musculo-skeletal system (M)	2.7	11	1.1	16
Dermatologicals (D)	2.6	12.5	1.6	13.5
Antiparasitic drugs (P)	2.6	12.5	1.6	13.5
Homeopathic and alternative medicines (Y)	2.3	14	7.0	6
Various (V)	2.1	15	3.7	10.5
Not registred medicines (X)	1.0	16	1.6	13.5
Sensory organs (S)	0.8	17	0.0	17

$R_s = 0.72$, $p < 0.01$

Comparison of the ranking of the 17 main categories in the ATC system is a rather rough measure, we therefore compared the ten most frequently discussed subclasses in the scientific medical literature with those of the newspapers. Eight of the ten subclasses were on both agenda's: cytostatic drugs (L01), vaccines (J07), virus-tatics (J05), systemic antibiotics (J01), analgesics (N02), sex hormones and stimulants of the genital system (G03), anticoagulants (B01), hypotensives (C02) (see table 6).

The negative aspects of the use of medicines received proportionally more attention in the scientific and medical literature (26%) than in the newspapers (14%). If we compare the "bad-news"-agenda's, it is noticeable that the agenda's are quite different. However, the "good-news" agenda's were comparable (data not shown). Seven of the ten most frequently discussed subclasses of drugs were discussed in both the newspapers and scientific and

Table 6

Comparison of the two agenda's on the second level of the ATC system (incl. % publications concerned with negative aspects)

Scientific medical literature			newspapers		
ATC subclass	number	% neg. aspects	ATC subclass	number	% neg. aspects
1. Cytostatic drugs (L01)	90	33	Vaccines (J07)	23	0
2. Vaccines (J07)	73	12	Sex hormones (G03)	19	32
3. Virustatics, syst. (J05)	73	15	Analgesics (N02)	10	20
4. Syst. antibiotics	71	39	Cytostatic drugs (L01)	7	14
5. Analgesics (N02)	62	29	Psychoanaleptics (N06)	6	33
6. Sex hormones (G03)	62	50	Various (V03)	6	0
7. Immune sera/globulines (J06)	61	3	Hypotensives (C02)	6	0
8. Psycholeptics (N05)	60	40	Virustatics, syst. (J05)	5	0
9. Anticoagulants (B01)	57	30	Syst. antibiotics (J01)	5	0
10. Hypotensives (C02)	53	34	Anticoagulants (B01)	5	0

medical journals in a positive way. In contrast, only four subclasses of the drugs discussed in a negative way in the newspapers could be found on the "bad-news" agenda of the scientific and medical journals. Sex hormones and stimulants of the genital system was the most frequently discussed subclass in a negative manner for both the newspapers and the scientific and medical literature. It is interesting to notice that this same subclass is on second place of the "good-news" agenda of the newspapers whereas it is not mentioned with the 15 most frequent positively discussed subclasses of the scientific medical literature.

3.4

DISCUSSION

The scientific and medical journals are the most important sources of ideas and information for journalists writing about medicines. The second most important source comprises the contacts of researchers with journalists direct or indirect through the press releases from universities [10]. Scientific journals are the most important communication channel for scientists. Although the scientific and medical journals are not especially targeted at journalists, journals do have certain standards, like the Ingelfinger-rule¹ which keep the content of their articles newsworthy. Fur-

1 The Ingelfinger rule is a policy of journals of considering a manuscript for publication only if its substance has not been submitted or reported elsewhere. This rule was promulgated to protect the New England Journal of Medicine from publishing material that had already been published and thus had lost its originality. Ingelfingers' successor, Relman, maintained this policy, and saw it as a way to discourage public announcement of research findings before publication in a scientific journal, as well as to discourage the growing practice of redundant publication (14)

thermore, the editors or publishers of scientific and medical journals are interested in mass media publicity and therefore send issues or press releases about articles to journalists in advance. For example, advance copies of the *New England Journal of Medicine* and *Science* are sent by first-class mail to journalists [1].

As shown by data presented in this paper, newspaper articles discuss the same main groups of medicines as discussed most often in the scientific literature. The two agenda's are comparable as shown by relatively high correlations. Eight of the ten most frequently discussed subclasses were on both the agenda of the newspapers and scientific and medical literature. However, we have to bear in mind that the agreement, as shown by these high correlations, does not establish a causal relationship between the scientific and medical journals and the newspapers. We have to keep in mind that press releases from universities and contacts with researchers may also influence the selection of topics by journalists. Furthermore, it may be argued that the mass media sometimes influence the research agenda, although it is very unlikely that any such effect would become manifest during the short period studied here.

The agenda of the scientific and medical literature did not change significantly during the research period of nine months. A study over a longer period might naturally detect a shift in the attention for certain research topics. Future research should analyze the scientific and medical literature over a longer period on an interval basis, so that changes in the agenda of the scientific and medical literature can be found and compared with possible changes in the newspaper agenda. The data in this study also suggest that when the agenda for medicines in the scientific and medical literature is determined by using the main ATC groups, an analysis of editorials and articles is sufficient.

The negative consequences of the use of medicines receives proportionally more attention in the scientific and medical literature than in the newspapers. Although it has been suggested that "bad news" is more newsworthy than "good news" [15], Dutch newspaper journalists seem more interested in "good news" about medicines. The "good news" agenda of the scientific and medical literature is comparable to the "good news" agenda of the newspapers. The "bad news" agenda's, on the other hand, are very different. We cannot explain this difference.

In both the newspapers and the scientific and medical journals anti-infective medication and drugs for the central nervous system are the most important groups of medicines discussed. However,

the third most important group in the dailies is the group containing the sex hormones, whereas this group is only in seventh rank on the scientific and medical agenda. This group contains for example "the pill", estrogens and progesterone. These medicines are used to prevent pregnancy, menopausal complaints and osteoporosis. In 1988 one million women in the Netherlands used "the pill" [18]. So, the news about these medicines concerns a large number of the readers of the dailies. Furthermore, the controversy over the harmful effects of estrogens still persist after more than fifty years of use [19]. These two reasons might explain the proportionally large attention paid to this group in the newspapers.

Much attention in both newspapers and scientific and medical journals is also paid to the anti-infectives. This group includes vaccines and systemic virustatics, both categories were discussed, among other things, in relation to AIDS.

In conclusion we can say that there is an agreement between the main groups of medicines discussed in the scientific and medical literature and those discussed in the daily newspapers in the Netherlands. Although it has been suggested that journalists are more interested in "bad" news, we found the opposite in this study concerned with medicines.

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