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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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# SOURCES OF IDEAS AND INFORMATION<sup>1</sup>

## **Abstract**

In this chapter we describe from which sources science writers who write about medicines in daily newspapers get their ideas and information. This study was undertaken because mass media, and therefore newspapers, can play an important role in the diffusion of information about medicines. Two approaches, interviews and a content analysis, were used to answer the research questions. Both methods show the importance of professional medical journals and information from universities and their hospitals as sources of ideas and information. Although the pharmaceutical industry did not seem to play a role as source of ideas and information according to the journalists, it is the third most frequently cited source of information in the newspaper articles. To gain a better insight in the role of the pharmaceutical industry as source of ideas and information for newspaper journalists further research is necessary.

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1 Published in *Social Science & Medicine* 1994; 38 (4): 637-643

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## 2.1

### INTRODUCTION

The general public as well as health professionals may use many different sources of information about health, illness and medicines. Study results show that family magazines and daily newspapers not only play a role as source of medical information for the general public [1-3], but inform physicians and other groups of health professionals as well [4-6]. Medical news, including news about drugs, is an important category within the area of science news as a whole. In the Netherlands about 25% of the science news in the daily newspapers concerns medical topics [7].

Science correspondents writing articles can make use of various sources. Science correspondents' major sources of information have shown to be scientific journals and personal contacts with scientists [8-10]. Sometimes, information from scientific meetings is viewed as useful. In general, the industry of science and technology does not seem to play an important role, according to Jones et al. [8]. However, the pharmaceutical industry is increasingly interested in informing the public through the media. In the Netherlands, pharmaceutical companies, as in many countries, have agreed to a code embodying the principle that they shall not advertise for prescription drugs to the general public [11], but it is clear that companies will seek to pass on certain messages to a mass audience. In particular, one sees that pharmaceutical companies in various countries seek to gain the interest of the mass media journalists [11-14]. For this reason, we believe that, contrary to the findings of Jones et al. [8], who studied general science writers, for reporters who write about medicine, the pharmaceutical industry does play a role as news source when the issue is medicines.

In view of the above it is relevant to understand how science correspondents who write about medicines get their information. Where do they get the ideas from and where do they get information? In the present study we have focused on the journalists working for newspapers. We excluded T.V. reporters because little attention is paid to (medical) science news on Dutch television [15].

## 2.2

### METHODS

Two approaches were used in order to find out which sources journalists employ to get ideas ("idea sources") and from which sources they obtain information ("information sources") on the

chosen topics. Firstly, two indepth interviews were conducted with journalists who write about medicines. Secondly, a content analysis was undertaken of newspaper articles in which medication was mentioned.

Because we used interviews there was a possibility we might receive socially desirable answers. Content analysis of articles published in the media employing the journalists concerned, can solve this problem to a considerable extent. Interviews are needed to collect information about the sources of ideas. Furthermore, an interview was needed in order to understand the reasons for using particular sources and for mentioning or not mentioning sources in articles, etc.

The seven journalists interviewed in this study, were selected by screening articles on medicines and noting their authors in four national and two regional daily newspapers. The journalists most often named as authors of articles on medicine were approached for the study. All seven of them participated in the first interview; one respondent did not participate in a second interview.

The circulation of the dailies, the respondents work for accounts for ca 42% of the total circulation of all Dutch dailies. The newspapers, which these journalists work for were, included in the content analysis, except for one regional newspaper. In fact, regional newspapers do not devote much attention to science news in general [7], but it was considered wise to carry out a content analysis on one of them. Within the category national newspapers, we subdivided papers in quality newspapers and popular newspapers [16].

### **Interviews**

During these interviews we asked two questions about the sources of ideas, one open ended question and a question in which the importance (on a four point scale) of the different idea sources was asked. Furthermore we asked questions about the sources of information, especially information sources used when a new drug becomes available and the reasons for using particular sources. Special attention was devoted to the scientific and professional medical literature, because several studies show that this is an important source for science correspondents [8-10,17]. Questions were asked about the journals to which they have access, the journals they use and the way they use different types of publication. We also paid special attention to the pharmaceutical industry as a source, because of the increasing interest of companies in the media. Furthermore we talked with the journalists about their training and experience in journalism.

### Content analysis

All articles were selected in which medication of some sort was discussed and which had appeared over a period of 4 months (June - September 1991) in five daily newspapers. However, articles on drug policy were excluded because the journalists who were interviewed indicated that they themselves do not write articles on this topic, which is covered by other colleagues.

The articles were coded on several topics. First of all we differentiated between stories from news agencies (N.A.stories) appearing in the papers and stories written by the staff or by freelance journalists (original stories). The N.A. articles were excluded from the analysis because we wanted to compare the results of the content analysis with those of the interviews.

Furthermore we coded the sources mentioned and informants mentioned in the article. We distinguished between the following possible sources: (1) scientific or medical journals; (2) information coming from Dutch universities and university hospitals, e.g. information from dissertations or information coming from university researchers; (3) the pharmaceutical industry; (4) information from scientific meetings; (5) and other sources mentioned in the article. Whenever more than one source was mentioned in the article we coded the different sources, with a maximum of four sources per article.

Whenever a scientific or professional medical journal was mentioned as source of information we tried to find the original article, categorizing this as an original article, editorial, letter or review.

We coded the pharmaceutical industry as a source whenever a particular company or the pharmaceutical industry in general were mentioned in an article. For those cases in which it seemed that the information could have come from a company directly, we called the company and checked whether the firm had initiated contact with the press.

## 2.3

## RESULTS

### Results of the interviews

**The journalists.** The length of experience in journalism of the various writers interviewed varied from 6 to 37 year. The journalists' training was also diverse. Only one journalist had followed a special course in science journalism. Three of the respondents had been to university and studied political sciences, chemistry and biology respectively. Only one of the journalists contributed items other than medical news.

**Idea sources.** All the journalists reported the use of professional medical journals and press releases from pharmaceutical companies as sources of ideas for articles about drugs. Other newspapers also seemed to play a role as source of ideas, as did the press releases from universities and university hospitals and items from news agencies. Some journalists also mentioned scientific meetings, press releases from government institutions and personal contacts with researchers as possible source of ideas.

We also asked a question about the importance attached to the different idea sources. Again the professional medical journals appeared to be viewed as the most important sources of ideas, followed by press releases from universities and university hospitals. Although all the journalists mentioned the press release from pharmaceutical industries as idea source they did not seem to attach much importance to them. This is illustrated by the following remark: "They already sent us too many press releases about drugs which they consider to be major importance breakthroughs but which in fact were simply me-too drugs - not even innovations".

A reason for the importance of the journals the journalists mentioned is the Ingelfinger rule which most journals subscribe to. 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. Ingelfinger's 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 [18]. According to some of the journalists this rule on occasion impeded them in the free gathering of news. The remaining journalists found this rule of some importance because it provides some guarantee that an item can be regarded as new.

Other daily newspapers were mentioned by all but one journalist. They were not considered to be very important as source of ideas. All the journalists read other national daily newspapers, some read also foreign ones, because they wanted to know what their colleagues - or as some put it their rivals - were writing about. Another reason is, as one of the respondents indicated: "...if another brings some medical news in a big way I have to follow and write an article on that subject as well."

**Table 1**  
Function of sources

Source	Function	
	Idea	Information
Scientific journals	+	+
Press releases universities	+	-
Press releases pharmaceutical industries	±	±
Personal contacts with researchers	±	+

**Information sources.** Professional medical journals were also very important as a source of information (Table 1). Two reasons were given: (1) the most important developments are described in the journals and (2) the research that is reported is peer-reviewed prior to publication by experts giving the journalist a reasonable guarantee that the study has been performed properly and conclusions are drawn correctly. Two journalists, however, indicated that a peer-review system is not always waterproof citing disputes involving the work of the Dutch professor Buck<sup>1</sup> and the French professor Benveniste.<sup>2</sup> Another journalist saw also a positive facet of a peer-review system less strict providing a chance for highly controversial studies to be published citing precisely the paper by Benveniste in Nature.<sup>2</sup>

The independence of a journal was important to most of the journalists. Independence, however, is not always guaranteed, since sometimes supplements are financed by pharmaceutical companies. For this reason one journalist omitted all supplements as a source of information.

Press releases from universities and university hospitals, though important as a source of ideas, were not important as a source of information. According to the journalists they contain insufficient information. If a journalist gets an idea from a press release, he or

1 Buck. In April 1990 professor Buck and his colleagues announced at a press conference a major breakthrough in the AIDS research. The day after this press conference the results were published in Science. However, later this month there were doubts about the stability and purity of the substance used in the experiments. A year later, a research committee observed shortcomings and mistakes in the planning of the research, the interpretation of the results and their presentation in the Science article.

2 Benveniste. In Nature in June 1988 a article about experiments with highly diluted solutions written by Dr. Benveniste and his colleagues was published. This article was accompanied by an editorial reservation in which the editorial board announced a repetition of the experiments in the presence of three independent investigators. Although many referees commented on the article and expressed their doubts, the article was published. The independent investigators concluded in July 1988 that the claims made in the article were not to be believed for several reasons.

she has to contact the researcher in order to collect enough information for writing an article.

Pharmaceutical companies were not considered to be important sources for drug information in general. As one respondent said "You bear in mind the fact that pharmaceutical companies have a commercial interest in getting stories about their products in the newspapers". However, when a new drug is registered or becomes available the major source of information is the pharmaceutical company that produces that particular drug. When a new drug is "discovered" scientific journals like *Nature* and *Science* play an important role. Sometimes the journalists received information from researchers in universities or hospitals about new drugs. The respondents indicated that researchers in universities and medical specialists are also important as sources of information about drugs in general, especially to check information.

The information sources used to write an article are not always mentioned in the article itself. Reasons to mention a source are: (1) when the source is an authority and is the reason for selecting the information so that the article derives its newsworthiness from the source; (2) to enable the reader to look up the original material on which the article is based; (3) to enable the reader to make up his own mind about the reliability of the source and the information presented in the article. The main reason for not mentioning (all) sources was making an article unnecessarily difficult to read. Other reasons were that a particular source does not mean anything to the reader, or that too many sources were used to mention them all.

**Scientific and professional medical journals.** Because the scientific and professional medical journals were expected to be a major source of ideas and information, we also asked the journalists to which journals they have access. The journals listed in Table 2 were also described by the journalists as those which were important for collecting information about drugs. Besides international scientific and professional medical journals, all the journalists read at least two Dutch medical or pharmaceutical journals. Almost eve-

**Table 2**  
International medical and scientific journals (n=7).

	Number of journalists having access
<i>New England Journal of Medicine</i>	6
<i>Science</i>	6
<i>Nature</i>	5
<i>The Lancet</i>	4
<i>British Medical Journal</i>	3

ryone read a popular science journal (e.g. *New Scientist*). Besides the direct access which the journalists have to international journals, the wire services from press agencies are active in screening the journals and supplying the journalists with information from these same sources. Furthermore several pharmaceutical companies send press releases whenever an international scientific or medical journal publishes a study concerning one of their products.

Because the journalists did not mention any French or German journals, we asked whether they did not read those journals and if not, for what reason. They did not read these journals because as they said all important studies would appear in the English or American literature. Three journalists indicated to have problems in reading French articles, especially scientific studies.

The respondents valued sections within a journal differently. Almost all journalists valued editorials very highly. They appreciated an editorial about a research article because it told them something about the value attached to the study and placed the study in a context. One respondent indicated that the importance of a study is underlined whenever an editorial is written about it. Most journalists keep review articles in their files to use whenever they are going to write a major article on the subject. Seldom does a review article, however, provide a reason for writing an article. Only on rare occasions did they make use of letters to the editor, they indicated that whenever an interesting discussion arose on a particular subject these letters could be useful. For different journals, however, this section is valued differently. A letter in *Nature* is considered to be of more importance than a letter in a Dutch journal. The identity of the author of a letter can also make a difference.

**Universities and university hospitals.** All respondents received press releases from the different universities and university hospitals in the Netherlands. They also received agendas in which the dissertations are mentioned. According to some journalists certain universities were more active in informing the press than others. One respondent suggested that an active role of the information service can lead to more attention. The journalists working for the regional daily newspapers paid special attention to the universities in the area. The journalists working for the national newspapers reported no preference for any specific university. They chose to write an article whenever a subject interested them. Theoretically some universities or hospitals may receive more attention because of their research topics.

**Pharmaceutical industry.** The pharmaceutical companies were reported to approach journalists in various ways. Sometimes they hire a public relations firm to establish press contacts. Several industries send their own magazines to the journalists; for example six of the seven respondents received Janssen News, published by the drug company of that name. Besides these magazines the journalists received press releases and phone calls to invite them to press conferences and national or international scientific meetings. These press releases point to official approval for marketing of new drugs, as well as to publications in international professional medical journals, concerning the firms' products. Usually, such an announcement is accompanied by a copy of the publication. The journalists indicated that Schering sends them approximately once a month a study published in an international journal with a translation or abstract in Dutch and a comment by a Dutch expert.

The journalists expressed a critical attitude towards information coming from the pharmaceutical industry. They are aware of the reason why the pharmaceutical industry sends them information. Furthermore two journalists indicated wariness of information bias in this material. The information may be "good", but often represents an one-sided view.

#### **Results of the content analysis**

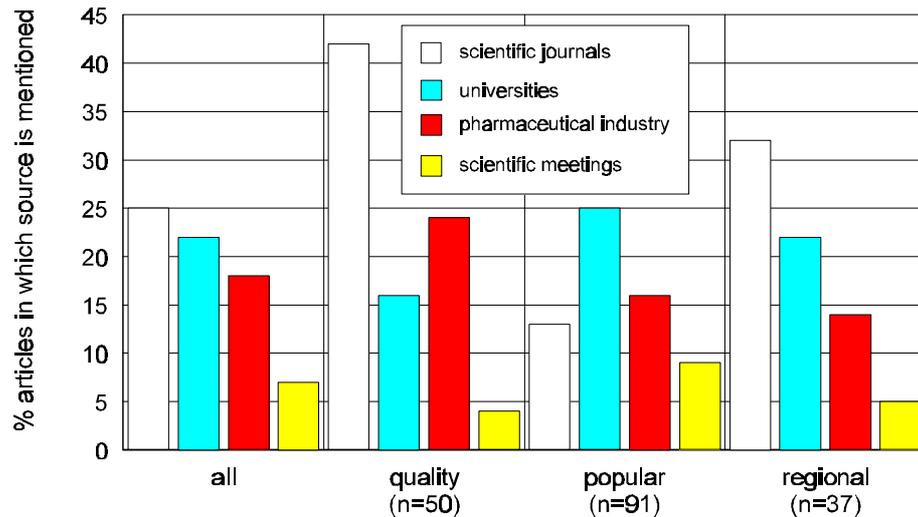
Over a period of four months a total of 207 articles were found. Of these 178 articles were classified as original articles; this accounted for approximately 86% of all the articles on drugs that appeared during that period. This percentage did not differ over the different types of newspapers.

**Information sources in newspaper articles.** In 45 of the 178 articles the journalist referred to a publication in a scientific or medical journal. In 39 articles there was a reference to a researcher at a university or hospital or to a research project in progress or to be initiated at a university.

In 32 articles the name of a pharmaceutical company or association was mentioned (figure 1). A consumer organization was cited in 11 articles.

Articles in the two popular newspapers accounted for 51% of all articles found in the four month period in five daily newspapers. Universities were the most frequently cited source in popular newspapers whereas scientific journals was the most frequently cited source in the quality and the regional newspapers.

In 72% of the articles in which a pharmaceutical company was mentioned one or two other sources were cited. This proportion falls to 36% when a scientific journal is mentioned and 31% where



**Figure 1**  
Sources in articles (n=178)

the source mentioned is a researcher from a university or a university itself. When information from a pharmaceutical company is used another source is thus more commonly used and mentioned as well (Chi-square,  $p < 0.05$ ).

British and American journals were more often mentioned than Dutch journals. The *New England Journal of Medicine* was the most often cited journal (see Table 3).

**Table 3**  
Scientific and professional medical journals mentioned in articles (n=45)

Journal	Times mentioned
<i>New England Journal of Medicine</i>	17
<i>The Lancet</i>	11
<i>Nature</i>	4
<i>British Medical Journal</i>	2
Dutch journals	6
Other journals	6
Total	46

In one article two different scientific journals were mentioned

### Comparison of interview data and content analysis

Both methods show the importance of professional medical journals and information coming directly from universities and their hospitals as sources. Although the pharmaceutical industry did not seem to play an important role as a source of ideas according to the journalists, it is the third most frequently cited source of information in the articles in the newspapers. In order to explain this difference we analyzed the articles in which a pharmaceutical company was mentioned further. For twelve articles we did not gather information about press activities of the company. In five

articles no specific company was mentioned and one company could not be traced. Six other articles were excluded because of the negative attitude of the author towards the company; those articles could not have been initiated by press activities of the company. With respect to 20 articles we were able to get information about relevant press activities of the company. Ten articles may have been initiated by press activities of a company because press releases were sent or a press conference was organized. In six other articles a spokesman of a company was cited; in these articles the company also served as source of information.

These results suggest that the way in which we coded the pharmaceutical industry in the content analysis may lead to an overestimation of the frequency of the companies' role as source of information. On the other hand in the period studied 11 original articles were found about the introduction of three new drugs. The three producers of these drugs had organized press conferences. In seven of the eleven original articles the company is mentioned and coded as source of information. In four articles the company is not mentioned, although the articles were published the day after the press conference. This suggests an underestimation of the role of the pharmaceutical industry as source.

In both the interviews and the content analysis the *New England Journal of Medicine* is the journal most often mentioned. Because the journalists stressed the importance of an original article accompanied by an editorial we checked for the *New England Journal of Medicine* and *Lancet* articles which were used as sources to determine whether they were accompanied by an editorial. Of these 28 articles 24 have been traced of which 15 (62%) were published together with an editorial.

On a basis of the interview results we expected a difference in citing sources in articles, in particular the mentioning of scientific journals was expected to be less frequent in popular newspapers than in quality newspapers. This hypothesis was confirmed. In 42% of the articles in the quality newspapers a scientific journal was mentioned as source, whereas in only 13% of the articles in the popular newspapers this was the case (Chi square,  $p < 0.01$ ). The regional newspaper seems to be somewhere in between (see Table 3). On this point we must stress the fact that not mentioning scientific journals in an article does not mean that articles from scientific journals are not used to prepare or write an article for a popular daily newspaper.

## 2.4

## DISCUSSION

**B**ecause medical news is an important category within the general field of science news, and since people are known to use newspapers as a source of information on drugs, we investigated the sources used by medical journalists. In our study we differentiated between idea source and information source because they serve different functions within the process of making news. The results show that there is a difference between idea sources and information sources.

As other studies [8-10,17 ] have shown, the scientific community is an important source of ideas and information, both directly through personal contacts with researchers and indirectly through scientific and professional medical journals and press releases. Journalists seem to prefer the indirect contact with the professional community provided through journals partly because of the peer review system which the journals use, which gives the journalist some guarantee of reliable results and conclusions. Journals are chosen not only simply for the research they contain, but also for their editorial comments. The study supports the findings of Jones [8]. Journalists pay special attention to research articles which are accompanied by editorials because an editorial places such a study in a context and in effect indicates to the journalist the importance of the study done.

The journals used by the journalists have high impact factors and are widely considered, within the scientific community, to be among the most important in their field.

Indirect contact with the research community through press releases from universities and university hospitals seems less important as sources of information but more important as sources of ideas. The journalists indicate that the press releases draw their attention to some subjects but seldomly contain enough information to be used as sources of information. Stappers [19] who interviewed science writers in the Netherlands also found an alerting function for press releases from universities.

The pharmaceutical industry seems to be an important source of ideas and information about new drugs. This in contrast to the findings of Jones [8] who found the industry less important as an initial source for science writers. This difference may be due to the fact that Jones [8] studied general science writers while we limited our respondents to medical journalists. Our results are comparable to those of Soutoul [9]. She surveyed French medical journalists about their sources of information and found the industry to be

the sixth most frequently cited source. More important than the pharmaceutical industry in her work are for example consumer organizations [9]. When we compare our research findings with those of Soutoul we have to keep in mind that we asked the journalists especially about their idea- and information-sources on drugs whereas she asked her respondents about sources of medical information in general. Furthermore, we excluded articles on drug policy; it is our impression that in articles about drug policy consumer organizations do play a role as sources of information.

Despite the role of the pharmaceutical industry as source of ideas and information, the journalists claim to have a critical attitude. The companies supply the journalists with information in several ways: press releases, conferences, telephone calls etc. It is interesting to notice how they try to meet the need of the journalist, to have his story based on an independent source by sending copies of articles in scientific journals about their products. The journalists claim to remain critical because they seem to realize that the view and information from the pharmaceutical industry may be one-sided. The information which companies send may be good but one never knows what information is withheld. This sceptical attitude is confirmed by the results of the content analysis. Whenever a pharmaceutical company is mentioned in an article another source is often mentioned too.

In general, the results of the interviews seem to be confirmed by the results of the content analysis. However a few remarks have to be made about this comparison. The comparison on the level of the information sources is not completely exact because, as indicated by the journalists, not all the information sources are always mentioned in the articles. It is understandable that only the most important sources and the most influential ones are mentioned; since the source can make a story newsworthy, it is possible that sources like the *New England Journal of Medicine* are overrepresented in the content analysis. Whenever this journal is used it is mentioned in an article as opposed to a Dutch journal which may be considered to be less authoritative.

The difference between the results of the content analysis and the interviews regarding the role of the pharmaceutical industry may have been due to the way the pharmaceutical industry was coded in the content analysis. On the other hand this difference may have been caused by socially desirable answers in the interviews.

To gain a better insight in the role of the pharmaceutical industry as a source of ideas and information for newspaper journalists

further research is necessary. To overcome the difficulties of an interview with its inherent possibility of bias, one could envisage a study in which all the material which a journalist obtains from universities, pharmaceutical companies and other sources is analyzed and compared to newspaper articles that appear during that period. Another possibility is a study in which medical journalists are observed during their work. Such work has been undertaken in another field of journalism by Gans [20], but it is clearly labour-intensive and time-consuming.

## REFERENCES

- 1 Jong- vd Berg L.T.W. de, Haaijer-Ruskamp F.M, Trigt A.M. van. Evaluatie van een voorlichtingsbrochure over geneesmiddelen en de overgang. *Pharm. Weekbl.* 1989; 124: 870-876.
- 2 Jong- vd Berg L. de, Waardenburg C. Geneesmiddelengebruik tijdens de zwangerschap. Groningen: Styx-publications, 1991.
- 3 Visser T.J. Geneesmiddelenvoorlichting. Een overzicht. Leiden: Instituut voor Huisartsgeneeskunde en Wetenschapswinkel RU Leiden, 1989.
- 4 O'Keefe M.T. The first human heart transplant-A study of diffusion among doctors. *Journalism Quarterly* 1969; 46: 237-242.
- 5 O'Keefe M.T. The mass media as sources of medical information for doctors. *Journalism Quarterly*; 1970; 47: 95-100.
- 6 Phillips D.P, Kanter E.J, Bednarczyk B, Tastad P.L. Importance of the lay press of medical knowledge to the scientific community. *New Engl. J. Med.* 1991; 325(16): 1180-3.
- 7 Hanssen L.S.A.M. Wetenschap in de krant. In: *Wetenschap in woord en beeld.* Utrecht: Stichting Publieksvoorlichting over Wetenschap en Techniek, 1991.
- 8 Jones G, Connell I, Meadows J. The presentation of science by the media. Leicester: Primary Communication Research Centre. University of Leicester, 1978.
- 9 Soutoul P. L'information mdicale continue du grand public en matire de reproduction humaine. Diss. Facult de Medecine de Tours, Universit Franois Rabelais, 1985.
- 10 Willems J. Persberichten hebben doorgaans (zeer) laag rendement. *Massacomunicatie*: 1990; 18(3): 232-239.
- 11 Anonymous. Overheid dwingt farma-industrie tot rechtstreekse benadering publiek. *Bijsluiter* 1991; 8(4): 7.
- 12 Moser M, Blaufox M.D, Freis E, et al. Who really determines your patients' prescriptions? *JAMA* 1991; 265 (4): 498-500.
- 13 Lexchin J. Pharmaceutical promotion in Canada: Convince them or confuse them. *Int. J. Health Services* 1987; 7(1): 77-89.
- 14 Nelkin D. How to doctor the media. *New Scientist* 20 nov 1986.
- 15 Hendriks E, Willems J. Wetenschap op de Nederlandse tv. In: *Wetenschap in woord en beeld.* Utrecht: Stichting Publieksvoorlichting over Wetenschap en Techniek, 1991.
- 16 Kaiser A. Een wereld van papier. Werkwijze en uiterlijk van de Nederlandse krant. In: *Media in Nederland.* ( 6th edition, edited by J. Bardoel and J. Bierhoff). Groningen: Wolters Noordhoff, 1990.

- 17 Winnubst M. Wetenschapspopularisering in Vlaanderen. Katholieke Universiteit Leuven. Faculteit der Sociale Wetenschappen. Departement Communicatiewetenschap, 1990.
- 18 Angell M, Kassirer J.P. The Ingelfinger-rule revisited. *N. Engl. J. Med* 1991; 325(19): 1371-1373.
- 19 Stappers JG, Reijnders AD, Moller WAJ, Hesp LATHM. Wetenschap als gemeengoed: een studie van de wetenschapsvoorlichting in Nederland. 's Gravenhage: Staatsuitgeverij, 1983.
- 20 Gans H. Deciding what's news. New York: Random House, 1979

