

Improving Health Care Journalism

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Abstract

To improve health care journalism, criteria and assessment strategies are needed. This has proven difficult due to the various definitions of quality used by science and journalism. Recommendations are made to integrate these varying perspectives into a usable set of quality criteria.

Ranking the quality of health news must be conducted on the basis of consistent criteria. Several strategies are presented to improve evaluation. A two-step model is proposed to increase the quality of investigation and presentation in science journalism. This model is accessible to highly specialized as well as general journalists. An overview is provided of the basic rules in journalistic presentation, and the effects of medical reporting among recipients are discussed. Health reporting in the media and the quality debate concerning direct consumer/patient information (via Internet) is highlighted. Finally, the future role of health care journalism, journalists, and “personal evidence scouts” is discussed in the context of a rapidly changing and fragmented media world.

Bad science is no excuse for bad journalism. —Victor Cohn

First get the church full, then start to preach. —Henri Nannen

Introduction

Medical and health care issues rank consistently at the top of all scientific topics covered by the international mass media. In an analysis of three leading German newspapers, research at my institute found that from 2003–2004 medical issues comprised 27.7% of all scientific articles reported; in 2006–2007, this figure rose to 28.9% (Elmer et al. 2008). After medical topics, environmental sciences (15.0%) ranked as the next most popular topic, followed by articles on biology (12.7%). If behavioral sciences are counted as medical topics, coverage climbs to 58% in U.S. papers (Clark and Illman 2006).

The exact reasons for these consistently high rates have yet to be fully understood. However, three factors appear to play a role:

1. “Medicine sells,” as shown by the number of copies sold of any news magazine bearing a medical headline on its cover.
2. Output of medical research is greater than in any other scientific field; there are more publications, more conferences, and more press releases.
3. Medical issues meet many criteria of classical news theory (e.g., Galtung and Ruge 1965), such as “relevance,” to a very high degree, which raises their chances of being covered (Badenschier and Wormer 2010).

Public opinion on health issues is strongly influenced by the media. According to a national poll taken in the 1990s, the primary source of health news for the average U.S. citizen was television, which ranked ahead of information received from medical doctors (Johnson 1998). In a recent analysis of nine European countries, Gigerenzer et al. (2009) found that the mass media ranked lower as the source of health-related information behind family/friends, practitioner, and pharmacist. However, between one in three and more than one in two participants responded that they use the television as their source of health information “sometimes” or “frequently” (Gigerenzer et al. 2009).

Media reporting has been faulted with “unsettling” patients or “scaremongering.” This criticism stems primarily from medical professionals, their professional associations, and pharmaceutical companies, and relates to the following general cases:

1. Past reporting by the media has been very poor and/or inaccurate.
2. Past reporting, though correct, has exposed an “inconvenient truth” for certain stakeholders, who then respond, for example, by discrediting the article or journalist.
3. The meaning of *quality* is defined differently in (medical) science and journalism, and different perceptions exist as to what role journalism should play.

Each of these points affects how we approach “better health care journalism.”¹ If we are indeed to improve the state of health care journalism, we must do more than just identify current scientific mistakes in medical reporting; we must also incorporate in our criteria what it means to compose a “quality” article from a journalistic perspective. Some scientists may need to adjust their perception of medical journalism, for the journalist is not merely a translator but also a critic, whose very role may be to “unsettle” patients. With this understanding, we can begin to discuss what it means for scientists and journalists to share in the process of health care reporting. In addition, we must also recognize the dynamic interaction that exists between the media, patients, and health care professionals and be able to evaluate this within the framework of

¹ Since the reporting of clinical studies and fundamental medical research can impact patient behavior, a broad definition of “health care journalism” is used. In addition, medical journalism and health care journalism are used here synonymously. For further discussion of the classification of health news, see Brodie et al. (2003).

evolving technologies (in particular, the Internet). With these general cases and issues in mind, let us consider two broad areas:

1. Improving the quality of journalistic *investigation* to lead to “evidence-based journalism,” and
2. Improving the quality of journalistic *presentation* in terms of reaching an audience, increasing comprehension, maximizing reception, and addressing the accompanying psychological components.

When we analyze what it means to have “quality” presentation, an interesting conflict arises: in science, quality stands for completeness or differentiation, while in journalism it relates to how well a report is received by the target audience. Thus, in the spirit of Henri Nannen, founder of *Stern*: How useful is a complete and differentiated article that reports on a medical issue if it does not attract the masses? That is, if nobody sees or reads it.

Dimensions of Quality in (Medical) Science and (Health Care) Journalism

To improve health care journalism, the concept of *quality* must be defined. Our starting point is the assumption that the mechanisms and working routines in health care journalism can be regarded as processes that enable the best evidence—from both journalistic and scientific perspectives—to be discovered. I review how medical reporting must combine these two dimensions of quality and discuss assessment models that currently exist.

Quality in Journalism

Do articles from the yellow press or tabloid newspapers exemplify high-quality journalism?² According to at least one of three current perspectives in journalism, the answer is yes (Arnold 2008:491). Consider the German tabloid paper *BILD*. From an economic standpoint, *BILD* fulfills one aspect of quality: its daily circulation to nearly nine million daily readers is as high or higher than the next ten major German newspapers (AWA 2009). Even if this “market-oriented, audience-centered” perspective is deemed irrelevant in defining quality, a message’s impact factor must be considered. In addition, one must account for a functional, system-oriented perspective (Blöbaum and Görke 2006)

² “Quality” is a term widely used to distinguish between “quality” and “tabloid” newspapers. Newspapers in a broadsheet format “aim to provide readers with comprehensive coverage and analysis of international and national news of the day together with informed comment on economic, political and social issues” whereas the popular press (e.g., tabloids) is geared primarily toward “entertainment, mostly show-biz gossip, sport and sensational sex scandals” (Entwistle and Hancock-Beaulieu 1992:370). The borders are, however, not clear-cut. Even “quality media” have celebrity sections. In public financed television (e.g., in Germany) “entertainment” is prescribed by law as a necessary mandate along with information dissemination.

as well as a normative-democratic perspective (e.g., Rager 1994; Schatz and Schulz 1992). For our approach, the latter seems to be the most appropriate.

There is no generally accepted “theory of quality” in journalism (e.g., Bucher and Altmeppen 2003; Weischenberg et al. 2006). There is, however, a broad consensus that quality in journalism is a standpoint-dependent, multidimensional construct (see also Russ-Mohl 1992:85; Weischenberg et al. 2006:12). Thus, no simple assessment matrix of criteria can be generally applied. Quality in media can be only measured by considering different factors for each individual case: type of media, format, target group (e.g., scientist, laymen), point of reference (e.g., politics, economics, science). Direct comparison seems only possible between similar types of media. Furthermore, the structural context of production must be considered (Weischenberg et al. 2006).

At present, the most widely used criteria for determining quality in journalism are:

- accuracy (correctness), communication (presentation), actuality, relevance (Rager 1994) with ethics added later;
- diversity of sources and frames (Blöbaum and Görke 2006:321);
- diversity, relevance, professionalism, acceptance, and legitimacy (Schatz and Schulz 1992);
- diversity of sources, news factors (concerning the choice of a subject); cross check by a second source, critical assessment of sources (concerning the investigation); actuality, originality, transparency, comprehensibility, objectivity (Russ-Mohl 1992);
- the answering of WH-questions: who, what, when, why, etc. (Weischenberg 2001:79, 110);
- credibility, independence, and provision of context (cited from Arnold 2008).

It is neither possible nor necessary to discuss these in detail (for an overview, see McQuail 1992). However, it is important to know that they exist and that journalism adheres to its own criteria of quality. The question is: To what extent can these be applied in medical journalism, and how should they be measured?

Quality in (Medical) Science

Objectivity, relevance, and originality are often mentioned as criteria for quality in science (e.g., Merton 1985:299). Interestingly, these three criteria are often used to measure quality in journalism as well. Even in science there is no general consensus as to how these criteria should be quantified. Below I discuss different approaches to this and provide a short overview in the context of evidence-based medicine.

Philosophy of Science: Methodological Rules

The philosophy of science has identified several methodological rules to evaluate the quality of scientific work (e.g., the falsification approach by Popper 1963). However, in a review of the different approaches, Neidhardt (2006) admits to capitulation in an attempt to establish universal criteria for quality in science. Hornbostel (1997:166–169) states that there is no standardized scale for quality in a methodological sense because the criteria for an evaluation are variable, due to cognitive and social influences. This does not mean, however, that “anything goes” if there is a methodological argument to explain why a certain claim of knowledge in a certain field is acceptable. As a condition, Hornbostel sees ideals of explanation and strategies of validation and evaluation that are negotiated in the respective field. Evidence-based medicine (discussed below) is an example for such a context-embedded methodological evaluation.

Sociology of Science: Expert Judges

From a sociological perspective, the quality of a scientific work correlates, under ideal circumstances, with recognition from other scientists (Hornbostel 1997:93). Consensus among peers is seen as the best possible solution to replace a methodological evaluation (Neidhardt 2006). However, as Hornbostel points out, this may only be valid within a specialized field, where a certain consensus about methods, relevant questions, and available knowledge has already been established. The “peer-review process” is an example of broadly accepted expert judgment being used to evaluate the quality of a scientific work, with criteria such as pertinence, reception of the literature, originality, methodological correctness, relevance of the results, and clear presentation. Still, the peer-review process is disputed because subjectivity and other influences can affect outcomes (e.g., Fröhlich 2008; Nature 2010). Even when there is consensus from different reviewers, this collective judgment may be wrong. However, most scientific organizations as well as scientific journals see no practicable alternative.³

Scientometrics: Objective Indicators?

Throughout science, a necessity or wish exists to quantify the quality of research in different institutions through striking rankings. Such rankings are used often in political decision making as well as in profiling efforts by “winning” institutions. Originally, however, scientometrics was used to quantify

³ In some recent approaches, the classical peer-review system has been combined with “open” or “public” peer review. After initial evaluation, the draft of a scientific paper is posted on the Internet for comment by other experts before it is revised for final publication (Pöschl 2004).

research and, ideally, the structural indicators used should correlate with the acceptance of a certain scientific quality and reputation (Hornbostel 1997:186).

Some of the indicators that have been used include: number of publications (especially in peer-reviewed journals with a high citation index impact factor), number of citations, external funding, and scientific awards. To what extent the various indicators should be used to measure quality remains controversial (e.g., Fröhlich 2008). Many highly cited papers, for example, do not describe a scientific breakthrough but simply report on the nomenclature or lab methods used, which in the meantime have become standard. Surprisingly, the basic idea that the most widely read publications equate to the most important ones brings us back to the argument of market-oriented criteria discussed earlier for tabloid newspapers.

The Criteria for Evidence-based Medicine

Sackett et al. (1996:71) defined evidence-based medicine as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.” Evidence-based medicine contains five steps and includes the defining of a question, a systematic literature research, and a critical evaluation of the available evidence (Sackett and Haynes 1995). Its evaluation is based on strict criteria, as discussed by Guyatt and Rennie (1993) and Greenhalgh (2006). By using these criteria, it is possible to evaluate quality past the reputation of an author. In addition, Guyatt and Rennie (1993) and Greenhalgh (2006) provide ideal study designs to evaluate therapies, diagnosis, or risk factors. Strategies, such as randomizing and double-blind approaches, are introduced to reduce potential bias, and statistical indicators (significance, confidence interval) are used to quantify results. Relevance is measured by considering whether a sample is representative or if there has been a real benefit to the patient. Since 1992, systematic reviews of studies that focus on a specific question have been conducted according to these criteria and have included a statistical summary and weighing of the results (Petticrew 2001).

Although evidence-based medicine is still disputed within the medical profession, its high level of standardization is beneficial for journalists, and some of its criteria (e.g., “relevance”) are well known in journalism. Thus, basic checks can be applied schematically without special knowledge in the medical field. This might include, for example, verifying the hierarchy of methods (with a systematic review on the top) used in therapeutic studies (Guyatt et al. 1995). However, the quality of a systematic review is limited by the quality of the original studies available. What happens when no data are available, or only conflicting evidence exists? Topics of this nature are often very important to the media (e.g., vaccination against swine flu, the risks of mobile phones, or correlation between leukemia and living near nuclear power plants). In addition being “correct” in medicine is usually more difficult to define than, say, in mathematics.

Measuring Quality in Science and Medical Reporting: Models and Results

In the broad field of journalism, different, widely varying approaches exist to measure the quality of reporting. In *science* journalism, however, risk communication and accuracy studies have dominated the field (e.g., Peters 1994; Ruhrmann 2003). This has led to an evaluation process based on strict scientific standards—one that unfortunately does not reflect important journalistic principles (for a critical analysis, see Kohring 2005).⁴

To analyze quality in science journalism, one approach is to assess the extent to which the relationship and interdependency between science and society has been properly reported (Kohring 2005:283). In addition, the role of a science journalist requires careful consideration. A purely educational role—transmitting simple, uncritical descriptions of scientific results to the public without context or comment—is rejected. Journalism entails more than positive public relations for the scientific community. Thus, as we define approaches to empirically measure the quality of the science reporting, we must be mindful to retain established scientific criteria while incorporating important journalist principles (Wormer 2008b:346).

Practical Approaches to Measure Quality in Medical Reporting

The work of Moynihan et al. (2000) has served as a model for several attempts to measure the explicit quality of medical reporting. These attempts focused on the quantification of risks and benefits of medications as well as their costs, and raised the question of sources. Moynihan et al. attempted to “articulate basic principles of high-quality medical reporting, in line with an evidence-based approach to medicine” by adopting the following criteria as:

- What is the magnitude of the benefit, both absolute and relative?
- What groups of patients can be helped?
- What are the associated risks and costs?
- What possible links exist between the sources of information (studies or experts) and those who promote the therapy (e.g., manufacturers)?

Although their work was limited to a case study of three special medications, it inspired the creation of the Australian “Media Doctor” in 2004 (Schwitzer 2008). This project monitors the health news coverage of 13 Australian news organizations and is “dedicated to improving the accuracy of media reports about new medical treatments” (Media Doctor Australia 2010). Current news

⁴ With his criticism, Kohring follows the conclusion of the newspaper researcher, Otto Groth, who pointed out in the first part of the 20th century that there are different standards and indicators of measuring quality in science and journalism: “Acting under a severe misconception of the character of a newspaper and its resulting working methods and equipment, scholars believe that they can dictate the laws of science to the newspaper” (cited in Kohring 1978:175).

items that report on medical treatments are reviewed by independent and objective sources (approximately 20 clinicians and researchers) according to a standardized rating scale. The results of “good” and “bad” reporting are listed on the project’s web site.

The criteria used by Media Doctor follow a classic approach, aided by a peer-review system and rating catalog (Table 11.1). Explicit scientific criteria (e.g., accuracy) are not favored; instead, Media Doctor draws on criteria widely accepted in journalism: novelty, independence, diversity, and contextualization. One important criterion—the quality of the presentation (e.g., Is the story told in an understandable way and interestingly enough to be read by a broad audience?)—is only included in the comment section of a review where, for example, a “sensationalist headline” can be noted (Wilson et al. 2009). In principle, one must ask whether a story that is incorrect and yet presented well could be given a high rating. One could argue that the review system provides a fail-safe in terms of accuracy, because most reviewers are clinicians and researchers, whose judgment should imply a high degree of accuracy. However, some of the criteria (e.g., costs) may be weighted differently in various health systems.

The attempt by Media Doctor to integrate scientific and journalistic criteria is groundbreaking. It allows semi-experts to verify information easily and has since been adopted in Canada and in United States under the project name “healthnewsreview” (Schwitzer 2008).

Others have taken a slightly different approach. Lai and Lane (2009), for example, used a combined form of scientometrics and evidence-based medicine to compare 734 front-page stories from international newspapers. They evaluated how the scientific articles published in these newspapers corresponded to the actual research to derive publication status and evidence level. When they encountered unpublished results, they verified whether the results had been

Table 11.1 Criteria used by the Media Doctor project to evaluate reporting of a journal article (Wilson et al. 2009). Stories are rated “satisfactory,” “not satisfactory,” or “not applicable.” For criteria used to determine scores, see Media Doctor (2010).

Rating criteria: The extent to which a story:	
1.	Reports on the novelty of an intervention
2.	Reports on the availability of the intervention
3.	Describes the treatment or diagnostic options available
4.	Avoids elements of disease mongering
5.	Reports evidence supporting the intervention
6.	Quantifies the benefits of the intervention
7.	Describes the harms of the intervention
8.	Reports on the costs of the intervention
9.	Consulted with independent expert sources of information
10.	Went beyond any available media release

published in a scientific journal after the story in the mass media appeared. Lai and Lane conclude that journalists should always distinguish between medical research news that is based on mature research and news which is reported based on studies from preliminary findings. This approach relies to a high degree on a functional peer-review system and does not integrate journalistic criteria of quality (e.g., comprehensibility) into its evaluation.

Oxman et al. (1993) have proposed an index of scientific quality for health-related news based on seven key criteria:

1. **Applicability:** Is it clear to whom the information in the report applies?
2. **Opinion versus facts:** Are facts clearly distinguished from opinions?
3. **Validity:** Is the assessment of the credibility (validity) of the evidence clear and well-founded?
4. **Magnitude:** Is the strength or magnitude of the findings (effects, risks or costs) clearly reported?
5. **Precision:** Is there a clear and well-founded assessment of the precision of any estimates or of the probability that any of the reported findings might be due to chance?
6. **Consistency:** Is consistency of the evidence (between studies) considered, and is the assessment well-founded?
7. **Consequences:** Are all of the important consequences (benefits, risks, and costs) of concern relative to the central topic of the report identified?
8. **Based on answers to the above questions, how would you rate the overall scientific quality of the report?**

Oxman et al. (1993) tested the reliability and validity of the index among physicians, research assistants, and members from the Canadian Science Writers' Association. Although there was a poor response rate among journalists, the answers given offer insight into the problem of defining quality between the various expert groups. "Judging from their comments, this reflects in part the difficulty some journalists had with the whole notion of separating the scientific quality of an article from its other features (such as the quality of the writing) and of making a numerical rating of this quality" (Oxman et al. 1993:992–993).

Instead of evaluating in detail the quality of medical reporting in the mass media, a different strategy is to alarm the public if an extremely bad, misleading, or even dangerous report appears. This approach is taken, for example, on blog sites such as *Plazeboalarm* or *Bad Science* but it must be implemented carefully, otherwise it may have the opposite effect. Fast response time is the primary advantage here. It is much easier to identify an extremely low-quality report than to give a balanced evaluation, and when there is a high potential for bad reporting to harm patients, speed is important. One of the main criticisms, however, is that it indirectly serves to promote the therapy or treatment being reported, at least among those desperately seeking a solution. Thus, this

approach needs to be implemented carefully and communicated effectively to avoid deleterious effects.

Preliminary Conclusions

The strategies and criteria employed by Media Doctor and “healthnewsreview” have been implemented but whether these strategies can be universally applied throughout the entire health care system is debatable. Full integration of journalistic criteria (e.g., issue selection, presentation, readability, or vividness of an article) is still outstanding, and it remains questionable whether each criterion should be weighted equally. For example, is it enough for an article to be wonderfully written or must it fulfill other fundamental, important criteria, like being based on accurate facts or figures? To address this issue, let us look at an approach used by the German consumer organization, *Stiftung Warentest*, which weighs criteria independently; when a key criteria (e.g., a security feature in a technical device) fails, the product is rated as defective (*mangelhaft*) regardless of performance in any other area.

Although there are no final answers, there is initial consensus on some criteria of quality. Preliminary results have yielded recommendations for basic improvements. At the University of Dortmund, a group is currently working to establish a German version of “healthnewsreview” (“*medien-doktor*”) that will be designed to look at reporting via mass media as well as on the Internet (e.g., Google hits).

Status Quo of Health Care Journalism

The mass media report on medicine and health-related topics more than any other scientific issue, and the tone of coverage is mostly positive (see study of German newspaper media by Elmer et al. 2008:886). In the United Kingdom, Entwistle and Hancock-Beaulieu found a proliferation of health-related articles in the 1990s compared to the previous decade; however, they note a clear distinction in quality between the mainstream and popular press (Entwistle and Hancock-Beaulieu 1992:380).

Poor-quality medical reporting has been observed in many countries, although there are signs of improvement. Between March 2004 and June 2008, Wilson et al. (2009) analyzed 1230 news stories in Australia. Comparing these results to similar reports from Canadian and U.S. media they found that despite modest improvements in some areas, “the general media generally fail[ed] to provide the public with complete and accurate information on new medical treatments.” Deficits cited ranged from incomplete information, which is often skewed to extremes (underemphasized or exaggerated), to the failure to report complex research data. Coverage by commercial current affairs television

programs was especially poor. In an analysis of 500 new stories from U.S. press, Schwitzer (2008) found that 62–77% of these articles failed to address the facts adequately (in particular, costs, benefits, harms, and the quality of the evidence used or methodology).

From 1961 to 2000, Verhoeven conducted a long-term content analysis of medical topics on Dutch television (Verhoeven 2008). Over time, a strong decrease in the speaking time of experts was observed, commensurate with a strong increase in the speaking time allotted to laypeople. To explain this, Verhoeven (2008:470) hypothesized that the “layification of the speaking time might be explained by the transformation in the patient–doctor relationship that occurred between 1961 and 2000, and the rise of patient activist groups and activism around specific diseases like AIDS.” Paradoxically, during this same time period, television programs devoted less attention to everyday medical problems and increased coverage of diseases that required “first-class clinical care or new and specialized treatments” (Verhoeven 2008:467).

Long-term studies that analyze the development of medical or health care reporting are rare and are often limited to a single disease. Thus, it is difficult to provide an accurate status report. Nonetheless, based on the existing knowledge base, strategies to improve health care reporting can be entertained.

Strategies to Improve Medical Reporting

Two general areas in journalism could benefit from dedicated strategies to improve reporting: how a story is investigated and how it is subsequently presented. To illustrate the issues involved in journalistic investigation, consider the following anecdote taken from a professional training course entitled, “How to identify a good expert.” After imparting some basic knowledge to participants, a journalist working for a well-established online publication remarked: “Why should I know how to identify a good expert when I usually never have the time to contact one?”

Although the argument of “lack of time” may appear to some to be an excuse, it is one of the most serious problems facing a working journalist (Figure 11.1). In his latest survey of 256 members of the Association of Health Care Journalists, Schwitzer (2009) reported that nine out of ten respondents (89%) indicated that ample time constitutes one of the top two ingredients of quality reporting. Over half (53%) stated that the time allotted for investigations had declined in their organization over the past several years. This is verified by Larsson (2003), who cites “lack of time, space, and knowledge” at the top of his list of barriers to the improvement of informative value in medical journalism.⁵

⁵ Since much of medical reporting is done by an ever-increasing number of freelancers, “lack of time” may translate to “lack of financing” and even an endangered financial existence.

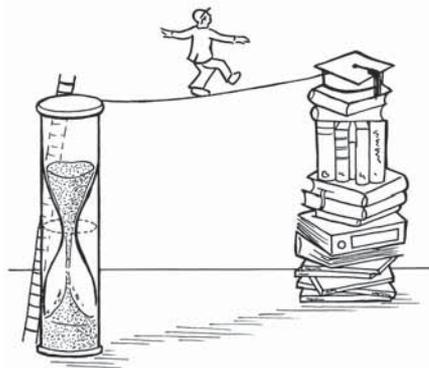


Figure 11.1 Balancing the demands of successful reporting, journalists often work under immense time constraints to get their story out (cartoon by Becker in Wormer 2006).

Despite this general tendency, some journalists still have a certain amount of freedom to decide how much time should be allocated on a particular story. Thus a gradational approach may most likely meet the variable needs of journalists: one flexible enough to account for the timescales involved in different media as well as the diverse levels of scientific expertise.

In terms of journalistic presentation, different issues must be addressed: What kind of information is necessary, and in which hierarchical order should it be presented, for a medical topic to be understood? To what extent is an “ideal information transfer” applicable to the media circus, which has its own rules and is governed by ever-growing competition? From the perspective of current communication theories, one must ask to what extent the media should even be used to communicate complex issues, such as medical or science-based health topics. Neil Postman (1986:7) illustrates the problem as follows:

Puffs of smoke are insufficiently complex to express ideas on the nature of existence, and even if they were not, a Cherokee philosopher would run short of either wood or blankets long before he reached his second axiom. You cannot use smoke to do philosophy. Its form excludes the content.

Postman postulates that the medium is the metaphor. Transferring this to medical reporting, we must question whether, for example, a one-minute piece of news reported on television is sufficient to qualify as discriminating health advice. Most notably, it is difficult to predict how a certain piece of information will affect listeners and/or readers.

A Two-step Model to Improve the Quality of Investigation

Several authors have proposed checklists for journalists to use when verifying the quality of medical evidence (Levi 2001; Moynihan and Sweet 2000).

However, differences that arise between the various media form a fundamental barrier to the standardization and application of these lists. A science journalist, who is a medical doctor by training and works for a monthly popular magazine, will have to meet different standards than a general news editor, who has to decide within minutes (e.g., on a Sunday) whether an announced medical breakthrough has a high probability of being correct. Based on experience with these two extremes, I have proposed a two-step model for science journalistic evidence (Wormer 2006). Here, again, checklists play a central role but they are more adapted to the needs of different journalists, publications, and time-scales (Wormer 2008a, b).

For the first step, the credibility of a scientific source must be verified; that is, reputation of an institution, (peer-reviewed) scientific publications, scientific awards, or external funding by foundations. Here, no special scientific knowledge in a particular field is necessary; instead, an understanding of the overview of general structures and criteria for an evaluation in the scientific system is required. Although this step is intended solely as an initial plausibility check, and contains problems associated with any scientometric-based evaluation, it can potentially weed out bogus announcements of “medical breakthroughs” or dangerous “miracle cures” (Wormer 2008b:351).

The second step involves the scientific (i.e., methodological, statistical) content of a publication, lecture, or announcement. Science journalists should be able to evaluate the presented results in terms of their validity, unambiguity, and consistency, and to cross check existing scientific literature in the field. Here, an additional checklist may be helpful (e.g., Antes 2008; Greenhalgh 2006). Only in a few cases will journalists have sufficient specialization in the required field to enable a detailed and substantial evaluation of the specific study. However, journalists should be able to identify other scientific experts and turn to them for an evaluation or explanation of the results. If the topic to be reported is based on an existing scientific paper, the peer-review process of the scientific journal will be extended by a second “science journalistic review process” (Wormer 2008a:223). Since the scientific peer-review process itself has been criticized, this additional review process could increase the value of the reporting and even contribute to scientific quality assurance. As Woloshin et al. (2009) criticize, the exaggeration of scientific results often begins in medical journal articles and journal press releases, which researchers believe and read with interest. In such cases, the mass media must “review” and correct such exaggerations. Especially in cases of scientific fraud, the mass media has often played an important role in the past.

The advantage of this two-step model lies in its ability to be applied by nonspecialist journalists and science journalists. It also contributes to a better structuring of each journalistic investigation. Furthermore, training experience with professional (but not specialized) journalists shows that this model has the potential to dismantle the apprehension associated with science issues. Instead of an “I-will-not-understand-it-anyway” attitude, journalists are empowered to

conduct an initial, formal check (first step) of the evidence. This can lead to the application of step 2 as well as a deeper application of step 1 (e.g., identifying citation networks by social network analysis).

Improving the Quality of Journalistic Presentation

Even after a thorough investigation is conducted, one must weigh how many details can, and should, be presented to a given audience. How many methodological facts are necessary to present the results and consequences of a certain research?

Usually, articles that report on medical issues contain sparse information about the scientific methods. They also fail to describe the limitations of scientific results, thus creating the impression that the results are more certain than they actually are (e.g., Dunwoody 1999). This has also been observed by the Media Doctor project and “healthnewsreview.”

The reasons for this lack in presentation could stem from investigation process itself: A journalist may fail to scrutinize the methods used (Dunwoody and Peters 1992). In addition, he may overestimate the significance of a peer-reviewed article, which still have a high degree of uncertainty, at least until the experiment or study is repeated by other groups. In the worst case, a source may be understood to be proven fact, although its intent was as a genuine “working paper” meant to spur discussion in the scientific community (Wormer 2008a:223; Angell and Kassirer 1994).

Another explanation for the lack of details about scientific methods holds that journalists believe that too much detail will overtax their audience (Dunwoody and Peters 1992). This explanation conforms to a recent survey of the heads of science departments in German media (Wormer and Cavaliere, unpublished). Whereas 51% of 37 respondents regarded knowledge about scientific methods as “very important” for an *investigation*, only 13.5% thought that the *presentation* of the scientific news in articles needed to include this information. The perception is that recipients prefer clear and short messages on how something is—not on how it could be (Angell and Kassirer 1994).

For this reason, controversies may, on the one hand, be intentionally suppressed by journalists who prefer to go with a simple, understandable story over a complete but complex presentation. This conflict between complete versus simple was demonstrated by Weber und Rager (1994:1–15): For journalists, “completeness” is usually not considered to be a central indicator for quality, whereas a simple matter of facts is an important marker for understandability.

In some cases, on the other hand, the uncertainties of results and doubts can be used by the journalist as a kind of rhetorical, dramaturgical means or as the consequence of a political controversy (Zehr 1999). The same phenomena are true not only for uncertainties but also for scientific controversies. Controversies are even considered a trigger for reporting in journalism (Friedman et al. 1999:12; Galtung and Ruge 1965). Furthermore, the usual

presentation techniques in journalism can amplify or even construct a controversy. The media tend to present different positions, in some cases even as a kind of surrogate for checking real evidence (Dunwoody and Peters 1992). In addition, the overarching rule that governs good journalistic practice—namely, the presentation of all sides of an issue—can actually get in the way of good scientific reporting because arguments are often presented as if they have equal validity, when in actuality a broad scientific consensus may already exist. Examples of such “balance as bias” phenomena can be found in the reporting on climate change (Boykoff and Boykoff 2004) and the effects of tobacco smoke (Miller 1992). Finally, because of their exotic and special character, self-proclaimed scientists (“mavericks”) may be attractive because they promise an interesting, unusual story that sets it apart from the “boring” business-as-usual-scientist.

Lewenstein draws a rather pessimistic conclusion on the ability to improve the presentation of controversial scientific findings (Lewenstein 1995:347):

Taken together...studies clearly imply that media coverage of controversies cannot be “improved” by better “dissemination” of scientific...information. Rather, media coverage is shaped by structural relationships within communities (including political relationships) as well as by the media’s need to present “stories” that have “conflict” embedded in them.

To improve the general perception and understanding of medical and statistical information, many recommendations resulting from educational research, cognition, and psychology (e.g., Gigerenzer et al. 2007) have been made and are applicable to the mass media and its recipients. Their implementation, however, is impacted by the need to attract crowds. This often means that the presentation of every single report, radio, or television piece is subjected to constraints in length, time, or density of information (see Postman 1986). Medical reporting in the mass media must not only attract patients and their concerned relatives, but also anyone who is just a little bit interested in such topics. Given the propensity of switching over to the next interesting topic on another program or page at any given time, attractiveness and comprehensiveness of media pieces (e.g., vividness and narrative style) as well as linguistic aids (e.g., short sentences or use of repetition) play a major role in determining the quality of health news reporting (e.g., Brosius 1995; Kindel 1998).

Possible Effects of Health Care Journalism

Studies about the perception and effects of health care reporting on recipients are usually limited to specific medical subtopics. One exception is a survey by Brodie et al. (2003), where more than 42,000 Americans were asked how closely they follow major health stories and what they understood from the issues covered. Four in ten adults answered that they follow such stories

closely. Brodie et al. report that this group of respondents was also more likely to give the correct answer to knowledge questions about these stories. This concurs with the findings of Chew et al. (1995), who observed that participants in the study demonstrated an increased knowledge about nutrition after watching only a one-hour television program, even when tested five and a half months after the broadcast. Although these studies do not allow us to predict a real change in health behavior, Li et al. (2008) report a significant increase of national iodized salt sales in Australia after a brief period of television and newspaper reports about the benefits of using iodized salt. They conclude that even brief news media exposure can influence health-related decisions. A further example is the dramatic decrease of hormone replacement therapy after widespread reporting of its adverse effects or the case of celebrities, such as Kylie Minogue, whose widespread breast cancer diagnosis seems to have contributed to an increase in mammograms among women who had previously never been screened. Finally, Phillips et al. (1991) emphasize the importance of the general press in transmitting medical knowledge to the scientific community itself.

These studies, which look for smaller effects, are at a high risk of only measuring simple correlations. They also are highly uncertain with respect to possible confusing elements imposed by other uncontrolled sources of information or memory effects. Gigerenzer, Mata, and Frank (2009) observe that information sources (including the mass media) appear to have little impact on improving public perception of mammography and PSA, although the poor quality of these sources may have contributed to this. Furthermore, doubt has been expressed as to how effective simple information in the media can really influence judgment or even change the opinion of people, especially those with strong beliefs (e.g., Brosius 1995). Brosius finds that recipients do not follow a scientific rationality when processing information from the media, but rather adhere to an “everyday rationality,” where presentation type and emotions play important roles. Another viewpoint states that “newspapers do not exist to be vehicles of health promotion or to further public understanding of medical science, but have the potential to contribute to these” (Entwistle and Hancock-Beaulieu 1992:380).

Whether people can identify good health information and distinguish it from misleading sources remains to be seen. People generally seem to rely on the reputation of a specific journalistic brand name to judge the credibility of information.

In a study involving Internet sources, Eysenbach and Köhler (2002) examined the techniques used by consumers to retrieve and appraise health information. None of the 21 participants checked formal quality indicators, such as “about us” sections of web sites or disclosure statements. This may indicate that a tiered strategy (such as the two-step model for science journalistic evidence or many of the checklists) may be preferable for a broader public as it would avoid overtaxing people (including those without knowledge of the

simplest evaluation techniques) with detailed information on how to read the statistics of a clinical study.

Establishing “Evidence as a Topic”

Among journalists, there seems to be little doubt that only a very limited amount of methodological details should be included when reporting on a health care topic. Instead of providing complete methodological information in an article (e.g., addressing the topic of a cancer or the swine flu), background information could be made available separately as a topic of its own. “Evidence as a topic” is attractive for certain types of media (e.g., the popular German magazine, *Stern*). It has also been successful in many recent books, some of which have made various bestseller lists. Focusing on topics such as “popular errors,” these books reveal the potential to attract a broad audience, for interest lies not only in medical results but also in good and bad science as well as its methodologies and pitfalls (e.g., Gigerenzer 2002). Another visible, but as yet unquantified, example concerns the interest in special aspects of risk and evidence related to “swine flu” and its vaccination during a period of focused reporting.

In support of evidence as topic, the German Network for Evidence Based Medicine established a new journalism prize, which was recently awarded to Markus Grill (2009) for his article “Alarm und Fehllalarm” [Alarm and False Alarms]. Such efforts to establish evidence as a topic of its own (e.g., by sensitizing journalists to these issues in their formation and permanent training)⁶ may be an important complementary component to the formal teaching of risks and evidence in schools (see Bond 2009).

The Future of Health Care Journalism

When discussing the future of health care journalism, we must address the potential of the Internet to communicate medical information directly to the consumer. The general market for medical advice and health reporting can be expected to grow in the future. However, there is also a high probability that this future market will not be controlled by independent reporting.

“Whether directly or indirectly, scientists and the institutions at which they work are having more influence than ever over what the public reads about their work” (Brumfiel 2009:274). At first glance, this statement could be regarded in a positive light, especially for those who lament the poor quality of medical reporting in the mass media. However, a scientist’s blog, a medical

⁶ These aspects have already been integrated into the bachelor degree program for “science journalism” at the University of Dortmund.

doctor's advice page, or the public relation "news" of a pharmaceutical company or scientific institution is rarely void of bias.

If the traditional role of journalism in a democracy as a watchdog—or at least as a moderator of competitive scientific opinions—is undermined, it is uncertain whether the average report from these groups will attain better quality than that from science journalism. It is also unclear whether future recipients will be able to distinguish between journalistic information and public relations (see also Eysenbach and Köhler 2002). Journalists often play a role in blurring this difference by incorporating the content of press releases verbatim in their articles without further investigation, or by using electronic material prepared by outside sources in their TV and radio pieces. Even editors of quality newspapers, such as *The Times* in London, admit: "If there's a good press release and you've got four stories to write in a day, you're going to take that short cut" (Brumfiel 2009:275).

In a fragmented media world that we expect in the future, standards of quality may become even more difficult to install or enforce. It may also become difficult to raise awareness or focus public attention on a specific issue (e.g., an important health campaign).

Need for a "googlehealthnewsreview"

People interested in medical advice on a particular topic often turn to the Internet, instead of the health section of their newspaper, and use a search engine (e.g., Google) to access information. Therefore, it may be useful to track the top results for medical key words from Google and other search engines as well as wikipedia and produce a kind of a new "googlehealthnewsreview" or "wikipediahealthnewsreview." Obviously, the difficulties of defining "quality" would apply here as they do for other media forms.

In a systematic review of 79 studies designed to assess the quality of health-related web sites, Eysenbach found that 70% of these studies regarded "quality" as a problem inherent in the Web (Eysenbach et al. 2002). The most frequently used quality criteria identified by Eysenbach were similar to those widely accepted in journalism: accuracy, readability, design, disclosures, and references provided. In addition, "completeness" was often mentioned.

In a more recent analysis of 343 web sites, which focused on information about breast cancer, Bernstam et al. (2008) came to a more optimistic conclusion: "most breast cancer information that consumers are likely to encounter online is accurate." However, in their opinion, commonly used quality criteria did not identify *inaccurate* information.

Several instruments are widely available to judge the quality of consumer health information (DISCERN 2010; Charnock et al. 1999); however, opinions vary as to the potential and limitations of these indicators. Griffiths and Christensen (2005) found that "DISCERN has potential as an indicator of content quality when used either by experts or by consumers." However, Gagliardi

and Jadad (2002) criticize that “many incompletely developed rating instruments” appear on web sites providing health information.

Further research is needed to compare and systematically reconcile the proposals that address quality criteria in consumer health information and quality criteria in journalism. This could serve as an external evaluation for both fields and may help direct potential improvements in both.

Future of Journalism in General

The future importance of directly communicating health issues via the Internet is closely connected to the future of journalism in general. Far beyond the acute effects of the recent financial crisis, it is doubtful whether the traditional financing of news media will suffice in an era where information is perceived to be offered for free via the Internet. It is extremely improbable that traditional media will disappear altogether; however, dramatic changes could impact the quality of health reporting. How can high-quality journalism be guaranteed? Weichert and Kramp (2009) raise the following options to support quality journalism in the general media:

1. Foundations could finance investigative quality journalism (e.g., ProPublica 2010).⁷
2. A general fee could be imposed not only on public broadcasting (e.g., BBC, ARD) but also on print media.
3. A surcharge could be levied on every Internet account as well as hard- and software, and the resulting funds transferred to the general media.
4. “Rent-a-journalist” or “investigate-on-demand” models, where the user pays for a specific investigation, could provide in-depth information (e.g., Spot.Us 2010).
5. Public institutions, such as universities, academies, and other educational organizations, should cooperate to ensure that quality data gets into the hands of reporters, and newspapers should be given the same tax status as educational institutes.

Although these ideas are relevant to general as well as health care journalism, some may be more applicable to health care journalism with a clear focus on educational issues. All models raise issues that relate to the independence and diversity of reporting, and some emphasize the need to pay for access to the mass media products via the Internet (e.g., Russ-Mohl 2009).

The media competence of the average person can be expected to become more important in the future. To ensure quality reporting on the Internet, it may

⁷ Although this model is less popular in German-speaking countries than in the United States, modest attempts in the field of medical journalism have been made, such as the “Peter Hans Hofschneider Recherchepreis” in Germany, Austria, and Switzerland (Stiftung Experimentelle Biomedizin 2010).

be helpful to examine the strategies presented in this chapter to see whether they can be applied here as well. In addition, the role of journalists in the future may expand to include training the public on how to verify medical information or to work as “evidence scouts” for individuals or interest groups such as NGOs.

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