
SCIENCE AND THE MEDIA: THE BOUNDARIES OF TRUTH

by Jay A. Winsten

Prologue: *In the fast-paced world of journalism, science writers are a special breed: well-trained, conversant in a wide range of health and medical subjects, and prepared at a moment's notice to translate for readers the meaning of the latest technological breakthrough. In the last year, their calls to action have been Barney Clark, Baby Fae, and, most recently, Bill Schroeder. At the same time, though, they often are viewed within their profession as the backbenchers of big-time journalism, experts 'in the scientific arcane whose subject matter only occasionally merits page-one attention or prime-time television coverage. What drives these journalists? What pressures are they subjected to as they strive to unravel the mysteries of science for an interested public and advance their own careers? In a landmark study, Jay Winsten, director of the Office of Health Policy Information at the Harvard School of Public Health, set out three years ago to answer these questions in an examination of how news judgments are shaped by organizational, economic, and professional incentives in the news business. He based his findings on interviews with science reporters and editors who are regarded as the best in the business. Winsten had impeccable credentials to undertake this project. He holds a Ph.D. in molecular biology from The Johns Hopkins University and has devoted considerable time to freelance writing for The Wall Street Journal, The Christian Science Monitor, and The New York Times. Winsten's Office of Health Policy Information serves as a resource center for federal and state policymakers and for journalists. The next project in his research on the impact of the mass media on public understanding of science and health policy involves the development of a primer to help scientists work more effectively with science writers.*

The level of public understanding of science and health depends on the quality of media coverage of these subjects.¹ This paper examines the distorting influence of competitive pressures in journalism and science, and presents recommendations to strengthen the quality of science news. The recommendations are designed, in part, to clarify distinctions between “facts” and “truth.”

Critics of media coverage of science offer a litany of complaints: that the press attributes an unjustified degree of certainty to new findings; that limited, incremental advances in research are portrayed inaccurately as major developments or breakthroughs; that the risks posed by putative health hazards are frequently exaggerated; that there often is a striking imbalance between the amount of attention accorded a piece of research and its actual scientific importance; that many medical news reports shamelessly exploit the emotions of desperately ill patients, their families, and the public at large; and that science news coverage often is plainly inaccurate, due to errors of commission, omission, or both.

One senior member of the medical community, who follows the media closely, offered this critique in a recent conversation: “If you take the proposition that it is the responsibility of newspapers to present to the public an understandable, ongoing chronicle of the significant developments in science, I don’t think that any of the great newspapers or news magazines in this country consistently do a good job; and the vast majority of them do a bad job. They are erratic, very idiosyncratic, and unpredictable in what they are going to do. A good job is the exception rather than the rule.”

These criticisms are sometimes justified. On occasion, the press falls victim to serious excesses which damage the public interest. However, the criticisms voiced from within science are often exaggerated, and in some instances reflect a fundamental misunderstanding of the goals, norms, strengths, and limitations of the press. Moreover, while scientists fault the press for major deficiencies in science news, a substantial share of the blame is more accurately attributable to the research community.

The research community has an important stake in the quality of science news. The media exert great influence in shaping the public’s understanding of, and support for, the scientific enterprise. The press plays a dominant role in selecting policy issues which receive priority on the public agenda and shapes the definition of those issues for public debate and resolution. Within medicine, the activities of the press are deeply

The author is grateful to Dr. Frederick Mosteller and Dr. Harvey Fineberg for their sustained support, encouragement, and advice. This study was conducted under the auspices of the Health Science Policy Working Group of Harvard University’s Division of Health Policy Research and Education. It was supported by a grant from the Andrew Mellon Foundation to the Health Science Policy Working Group, and by a grant from Mr. Ivan F. Boesky to the Harvard School of Public Health.

embedded in the processes of medical care delivery. Medical news reports may increase or diminish the willingness of individuals to present themselves for care (or for clinical trials), may raise expectations (sometimes falsely), may dash hopes, or may provoke alarm (as in some of the early press coverage of the AIDS epidemic). The quality of individual and policy decisions which rely on scientific information depends on the fidelity with which that information is transmitted from scientists to decisionmakers through the media.

If it wishes to improve the quality of science news, the research community must first understand how the press works from the inside. Towards that objective, some thirty-four months ago I initiated a series of interviews with science reporters, editors, and television producers at leading news organizations.² These twenty-seven interviews ranged in length from one to four hours and yielded over 1,000 pages of transcripts.

As the interviews progressed, it became apparent that the science press corps, in its senior ranks, consists of a dedicated group of professionals. They characterized their roles in society in diverse ways, ranging from "translator and educator" to "helping people to get better medical care" to simply "reporting the news." During a discussion of Legionnaire's Disease, one reporter offered this description of how she folds the job of educator into her primary role as news reporter: "[Legionnaire's Disease]

Exhibit 1

What Is Science News?

Standard definitions

News is what the public hasn't heard before.
 News is what "hooks" readers and viewers
 because it is important, interesting, or both.

Economic considerations—the front office's perspective

News is what creates a market for advertisers.
 News is what sells newspapers.

Internal organizational politics

News is what a reporter can get past an editor.
 News is what an editor assigns to be covered.
 News is what promotes a reporter's career.
 News is what a reporter's prior organizational commitments dictate.
 News is what justifies a reporter's expenditure of resources.

External influences—news sources and events

News is what news sources put out and promote.
 News is what events of compelling interest dictate.

External influences—the competition

News is what competitive pressures dictate.
 News is what group consensus within journalism decides it is. ("Bandwagons.")
 News is what The New York Times says it is. ("Big Media.")

External influences—the public

News is what "the talk of the town" says it is.

Noneconomic motives of journalists

News is what interests an individual reporter.
 News is what has impact.
 News is what enhances a reporter's prestige among peers.
 News is what appeals to senior editors' acquaintances.

Exhibit 2

Constraints On Quality

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| 1. Time. | 11. Difficulty in explaining science |
| 2. Space. | 12. Bias and style of reporters. |
| 3. Competition for page one. | 13. Experience of reporters. |
| 4. Competition among news organizations. | 14. Structure of news stories. |
| 5. Editor as gate-keeper. | 15. Headline writers. |
| 6. Editing processes. | 16. Need for a newspeg. |
| 7. Constant demand for something new. | 17. Prior reporting. |
| 8. Degree of access to news sources. | 18. Nature of the publication. |
| 9. Degree of disclosure by news sources. | 19. Tyranny of bandwagons.” |
| 10. Bias of news sources. | |
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was a wonderful medical mystery. It has all the elements of good fiction, and for the medical writer—while perhaps you think we get turned on to stories like that—it also provided a wonderful opportunity to really show the public, without appearing to do so, how diseases are tracked down, [etc.]. . . While you have the public’s attention, I think you have both an opportunity and a responsibility to really take advantage of it and drive home as much useful information as you possibly can.”

Analysis of transcripts of the interviews produced nineteen definitions of science news, each reflecting a separate influence on news judgments, as presented in Exhibit 1. These definitions translate, in turn, into a set of constraints on the quality of science news, as presented in Exhibit 2. Two particularly important constraints on quality, which are endemic to daily journalism, are the scarcity of time and space at the reporter’s disposal. The ranking of some other constraints in Exhibit 2 varies with the particular news organization. For example, in follow-up interviews, one reporter dismissed as inconsequential the role of the editor as “gatekeeper,” while another reporter complained bitterly that his editor vetoes coverage of important developments in science.

Competitive Pressures In Journalism

The most striking finding which emerged from the interviews is the dominant distorting influence of the “competitive force” in journalism. Competition occurs both among news organizations and among reporters on the same staff. Within a news organization, the journalist’s ambition to make page one has a powerful impact on the selection and treatment of stories.

Science reporters, based at preeminent publications, stated that competition for prominent display of their stories creates a strong motivation to distort their coverage. This competition creates a tension between

the incentive for reporters to hype a story and a counterdesire to maintain credibility. As one reporter put it:

I'm in competition with literally hundreds of stories every day, political and economic stories of compelling interest. In science, especially, we sometimes have to argue [with editors], pound the table, and say, "This is an important story. It turns a key of understanding, it affects a lot of people," or "it's just interesting, it's part of the unfolding romance of science." But we have to make that clear in our copy. We have to almost overstate, we have to come as close as we can within the boundaries of truth to a dramatic, compelling statement. A weak statement will go no place.

The science editor of a leading newsweekly, apprised of the preceding quotation, reacted as follows:

That's a good phrase, "the boundary of truth." I like to think that I don't overstep the boundary. But sometimes, in retrospect, you wish you had been a little more muted. If you had been muted, the editor would say, "Why are we running this story?" That's always the danger, of losing the story, if you are too low key. Science, relatively speaking, is allocated much lower priority compared to other aspects of the news. To get into print, you do have to beat the drum, and sometimes that leads to a little exaggeration.

A third journalist stressed the same theme:

In journalism the trick is to get as strong as possible a lead and story theme, without going overboard and being absurd so that you destroy yourself. There is always this tension of what is the strongest thing I can say about this story and still have it be accurate. It is not how wishy-washy, how cautious, how moderate can I make it, and get it buried way back in the paper. The fact is, you are going for the strong. And, while not patently absurd, it may not be the lead you would go for a year later.

Reporters differ in where they strike a balance between the imperatives of making the strongest possible statement and maintaining their credibility. Some reporters are consistently conservative and never cross the "boundary of truth." Others are perceived by their colleagues as occasionally exaggerating the importance of a story—though, on any given story, this can be a matter of subjective professional judgment and principled disagreement among peers. A small number of reporters—including some in leading news organizations with reputations for excellence—are judged by their colleagues as frequently overstepping the boundary of truth, misleading editors and the public about the importance and interpretation of developments in science and related public policy. Such behavior sometimes stems from either personal insecurity or excessive ambition on the part of a reporter, who may overcompensate for normal concerns about protecting one's job security and advancing one's career.

For example, one reporter had this to say about a colleague:

I think he knows better, but he just can't resist the cheap approach. He's very insecure. We all have our insecurities, God knows, but his way of compensating is to have a lot of stuff out there. His primary criterion is to be visible, visible, visible, and to hell with anything else—it's not quite "to hell with anything else," but it's coming close, often.

At the operating level, journalism's powerful bias in favor of the "strong" is expressed directly and explicitly by lower- and mid-level editors in their daily interactions with reporters. A science writer at a leading newspaper offered this description of the interactive process:

The desk editors are the ones who always want you to push it a little harder. I go to the desk, and they say, "Well, can't you make it a little stronger?" And then they give you an alternative. And I say, "No, you've just eliminated a qualifier, or you've added that word over there that's just not true." And you go back and forth like that. So there is a movement in the direction of a stronger statement—running out to the boundaries at which you've overgeneralized, at which you've just overdone it. . . . It depends a lot on the specific editor.

Where an individual reporter strikes the balance between competitive newsroom pressures and professional standards can vary with the stage of his career. For example, one journalist with a general assignment background described how his outlook changed when he won his struggle to be designated a full-time science writer by his news organization:

When I was trying to become a science writer, I felt compelled to come up with "groundbreaking" stories of "vital importance." They had to appear that way to get the stories accepted. Now that I'm established, my judgment is accepted, so I don't feel the pressure as much to "hype" a story. In fact, I think I have a tendency now to sort of downplay research—to put it into perspective—because I think it is morally wrong to scare the bejesus out of people when it's not justified.

At the intersection between science and public policy, the incentive for the science reporter to make the strongest possible statement is shared by elected officials. With the historic decline in the institution of political parties as instruments for political advancement, and with the concurrent rise of media politics, in which success at the ballot box depends on favorable media exposure, public office holders and aspirants share with reporters the challenge of breaking into print and onto the airwaves. Issues in science and medicine—ranging from EDB to "unnecessary" surgery—provide frequent opportunities for such exposure. To capture press attention, politicians sometimes oversimplify and overdramatize, thereby distorting public understanding. A Washington-based reporter offered this assessment:

Basically, the political and journalistic mechanisms tend toward I was going to say "exaggeration," which is not quite the right word. It is more

toward “stretching to the maximum within some permissible bounds.” They tend to emphasize things in the direction they are trying to go. And that is just the nature of the game, somehow—to get a story that will be read and displayed well, to get good strong reaction, you sort of have to go towards the limits of the permissible. We are off on that edge of the limit—the politicians are, too. The congressional hearings are. The whole mechanism is all focused on hitting a point hard. And basically, you would not hit it that hard, probably, in the long run.. and in the long run you don’t. You then start retreating a little bit toward the middle.

The preceding quotations can easily be misinterpreted. In the hands of a responsible reporter, the “stronger” story may actually prove to be the more accurate one. To develop a strong, accurate lead from among the facts, claims, counter-claims, and circumstances surrounding a story requires a firm understanding of the subject matter. The easier, quicker route is to settle for a safe, routine lead, written on the basis of superficial knowledge.

Nevertheless, the danger—sometimes realized—is that overemphasis on the “strong” will distort the news and mislead. Sometimes the tone of the story—the emotional content of its words—misleads, even when each sentence is factually accurate. Coverage of the AIDS epidemic offers numerous examples of this.

The media, and health officials as well, responded slowly to the AIDS epidemic. What finally galvanized public attention was preliminary information which raised the possibility that the disease might escape the confines of high-risk groups and threaten the public at large. Public reaction to news of this potential threat would have been severe under any circumstances, but was needlessly and harmfully exacerbated, and not only by the press. On May 24, 1983, influenced by political pressures, senior federal health officials declared AIDS to be the “number one priority of the Public Health Service.” This proclamation, meant to reassure the public, sent the opposite message, because it permitted—indeed, encouraged—people to conclude that the risk of contracting AIDS was far greater than health experts had been willing to admit. In addition to undermining efforts to quell the public’s fears, this proclamation officially certified a major news story for the media—and resulted in the first page one story on the epidemic to appear in *The New York Times*. Then, on May 26, ABC’s “20/20,” in its second program on AIDS, told 19 million television viewers, “There is now a steadily growing fear that the nation’s entire blood supply may be threatened by AIDS. . . . The safest thing to do is to store up your own blood.” The story’s factual content fell just within the boundaries of “truth.” The tone of the story could not have been better designed to provoke massive public hysteria.

While some patients facing surgery took the reasonable step of banking their own blood, large numbers of people refused to donate blood out

of an irrational fear that AIDS could somehow be transmitted to donors as well as recipients. In the weeks which followed the "20/20" broadcast, the Red Cross reported a precipitous and dangerous decline in blood donations nationwide.

The "20/20" broadcast, while condemned by some journalists, nevertheless set the tone for much of the ensuing coverage. A dominant characteristic of that coverage was a preoccupation with anecdotal reports of public hysteria. With notable exceptions, the media's saturation coverage of AIDS lacked balance and context and served to amplify the public's anxieties. AIDS was largely a story about fear, and the press went after it full throttle. For example, on June 17, 1983, during the height of the public panic over AIDS, *The New York Times* ran a page-one story, written by a general assignment reporter, under the headline, "AIDS Spreads Pain and Fear Among Ill and Healthy Alike." It was a major analytic piece about the social ramifications of AIDS. In the story's opening paragraphs, the reporter captured and held the reader's attention by presenting a series of images which resonated strongly with the public's worst fears. The first five paragraphs are presented below:

As public awareness of the disease known as AIDS has grown in the last few months, a picture has begun to emerge of the emotional and physical agony of those afflicted and of the fear, among homosexuals and about homosexuals, that has spread around the country at a rate much faster than the disease itself.

In New York, a restaurant owner reflects on the way his lover, shunned by hospitals and airlines and then by undertakers, died this winter of the ailment, acquired immune deficiency syndrome.

In Denver, a woman calls to ask how she should fumigate an apartment she bought from a homosexual.

In Houston, some people refuse to donate blood lest they contract AIDS from the needles at the blood bank.

In New Orleans, a club owner sees a turn toward monogamy, a retreat from the casual, anonymous sex that has characterized "the gay life style" for many homosexuals.

The only hint of reassurance about the negligible risk (at the time) to the general public was buried deep in the latter half of the sixth paragraph:

In Washington, as the number of cases nationwide mounts beyond 1,500 and the number of deaths nears 600, Government officials are proclaiming AIDS the nation's No. 1 health priority, though they emphasize their belief that the vast majority of people are not in danger of contracting the deadly disease.

Almost as if fearing that this minimal note of reassurance might break the story's momentum, the writer countered with a particularly strong seventh paragraph, which probably scared the daylights out of many readers:

And in Boston, [one patient], gripped by a cancer called Kaposi's sarcoma, racked by infections his body's stricken immune system cannot throw off, losing 10 quarts of fluid a day to a diarrhea the doctors cannot quell, struggles at the age of 33 to survive, to hope, to remain brave and to divine the meaning of this dread disorder.

Overemphasis on the "strong" in journalism sometimes results in leads which mimic the pitch of a circus barker, as in: "Scientists reported yesterday that they had produced the largest and most complex protein ever created artificially in the laboratory. . . ." (Page one, *The New York Times*, 26 April 1984.)

Of greater consequence are stories that blatantly misrepresent the facts. The example I want to cite is typical of a class of such stories. The overall tone of the article is moderate, and it is not immediately apparent that the story as a whole is distorted and misleading. On October 13, 1983, *The New England Journal of Medicine* published a paper which reported on development of a radioimmunoassay for ovarian cancer. That same issue of the *Journal* carried an editorial assessing the study which ended as follows: "Although the assay . . . is not as useful as we might wish, it clearly represents an advance." In striking contrast is the lead of U.P.I.'s news story, which was carried in the October 13, 1983 *Boston Globe*: "A new, simple blood test developed to measure tumor growth promises to aid greatly in treatment of ovarian cancer. . . ." Although the *Journal's* editorial stressed the limitations as well as the strengths of the blood test, the first 300 words of U.P.I.'s story contained no reference at all to limitations. Throughout this tightly written news story, the reporter—or his editor, who may have rewritten the copy—justified the exaggerated lead by omitting or underemphasizing key facts. The effect was to mislead the public about the immediate benefits of a limited though promising advance. The story thereby gained a readership larger than warranted by the "truth," and it did so by exploiting the hopes of cancer patients, their families, and the public at large.

The distorting effect of journalism's preoccupation with the "strong" is exacerbated by the media's constant demand for something "new." Stories such as interferon or EDB surface in the public consciousness, crystallize as major news stories, and remain prominent in the press for a period of time. To sustain the news value of such stories, there is a tendency to exaggerate their importance. One reporter described the phenomenon this way:

We all work for a great big hungry mob, all the hours on television and all the issues of news magazines and newspapers have to be filled up every day. I sometimes think of my job as that of the stoker. You know, you used to see him in the movies years ago. The stoker was the big burly guy without a shirt on, stoking coal into the hole of the furnace of an ocean liner. Well, we're sort of shoveling coal into the maw of this furnace that's

constantly burning up what we shove in, and we have to keep shoveling it in. There's always a demand for news, there's always a demand for something new. And I think interferon filled that bill for a lot of people and was overused. I think it was overblown. It may live up to that promise. But when it starts living up to it is the time to report it.

Competitive Pressures In Science

Scientists display a diversity of attitudes toward the press and the public. A large and growing number of responsible scientists are prepared to cooperate with the media, and some serve as regular sources of information for particular reporters. Other researchers continue to hold themselves aloof and view with disdain colleagues who delve into the public arena. In recent years, a third, increasingly prominent group has emerged from within science which has sought to exploit the press in pursuit of individual and institutional advancement. As one science writer characterized these self-aggrandizing researchers:

There are scientists who manipulate the press, who exaggerate their accomplishments, who neglect the contributions of their peers. And they often get away with it. Often the press is blamed for exaggerating something, and the scientists who gave them the story are just as much to blame.

There are concerns about inappropriate relations with the media among five discrete groups within science: academic medical centers, individual researchers, biotechnology firms, private health care practitioners, and universities,

Medical centers. As economic competition among hospitals has intensified, they have begun to compete aggressively for publicity. The public relations strategies of academic medical centers typically include the periodic use of press conferences to announce research. The press conference is an effective ploy because it exploits the competitive force in journalism. A metropolitan newspaper reporter, whose assignments no longer include daily medical news, described the impact of press conferences this way:

I felt bad about being victimized by the scientific establishment. The institutions would use the journalists' competitiveness against journalism, and against, I thought, the public interest. And we would go up like lambs to slaughter, and do exactly what the PR people in the institutions would want. All of these reporters, broadcast and print, would be at the press conference, and they would know that if they don't report the story today, they will be beaten by the guy sitting next to them. So everyone would rush to write the story.

The indiscriminate use of press conferences undermines the media's efforts to identify and report the most important and newsworthy research

advances. What institutions seek to advertise often bears no relation to what is important in science.

Researchers. Competition for publicity among scientific institutions is mirrored by competition among individual researchers. With increasing frequency, some biological scientists in the most competitive fields, caught up in a high-stakes race to capture priority for major advances, are using the media to attach their names to important findings before their competitors do. Some other scientists, despite their distaste for their colleagues' actions, have felt pressured into responding in kind to avoid losing credit which is deservedly theirs. The result has been a spiraling competition, sometimes characterized by exaggerated claims, in which "science by press conference" has begun to replace the traditional mode of scientific discourse. One reporter recounted this episode:

I got a call from an eminent scientist, whom I've known for some time, saying that he had accomplished a given feat. As a matter of routine, I checked with other people in the field to see what they thought this signified. And the first thing I discovered was that somebody else had done exactly the same thing at almost exactly the same time. The circumstances were such that the scientist from whom I got the original thing knew perfectly well that the other person had done it. He clearly had no intention of telling me. He wanted the credit.

Biotechnology firms. In the biotechnology field, efforts to exploit the press have been greatly intensified by high financial stakes. On September 10, 1984, for example, a biotechnology firm in California made headlines when it announced that its scientists had cloned the AIDS virus as a major step towards producing a diagnostic test and eventually a vaccine. Its stock price immediately rose 16 percent. The data on which the announcement was based had not been subjected to peer review, nor were the findings made available for public inspection.

Announcement of the company's claim was scheduled for Monday morning newspapers. A science reporter at a leading newspaper recalls that he was first alerted to the story in a Friday afternoon telephone call from a company spokesman. The timing of the call, just before the weekend, made it impossible to reach researchers elsewhere to evaluate the company's claim. The reporter made a decision—with which I disagree—to publish the story in the absence of independent confirmation of its validity and importance. Subsequently, on October 1, Dr. Robert Gallo of the National Cancer Institute was quoted by another newspaper as stating, "The genes have been cloned here [at the National Cancer Institute] since April. We haven't mentioned it because it wasn't worth mentioning." (*The Boston Globe*, 1 October 1984.)

In a telephone interview with me, a senior executive from the firm said they had not intended to imply that its accomplishment was either "remarkable" or a first. "We were the first to announce—to show our cards,"

he said. The executive acknowledged that the firm had been criticized for its announcement, adding that its lawyers had reviewed the incident and were satisfied that SEC fair disclosure rules had been met. He charged that the “press took liberties” with the story and exaggerated the company’s claims. However, the firm’s September 10 press release stated, “Scientists from [company’s name] have crossed a major hurdle in the development of a diagnostic test and vaccine for AIDS by cloning the genetic material of the virus believed to cause the disease.” The firm characterized the cloning as “a major breakthrough” in documents which accompanied the release. This case, and others like it, raise serious questions about the standards which reporters should set for reporting on unpublished, highly competitive research.

Practitioners. With the lifting of strictures against professional advertising, a small but growing number of physicians, surgeons, and dentists in private practice are aggressively seeking media coverage in an effort to attract new patients. Some have retained Madison Avenue-style public relations firms to assist them. Typical is this letter sent by a New York public relations firm to the medical editor of a leading newsweekly:

Dear [Journalist]:

Dr. [Smith], a leading New York dentist, is one of the pioneers of bonding. For the last eight years, he has been successfully using the technique on some of the most difficult cosmetic dentistry cases. Enclosed is background material. If your publication is planning an update, Dr. [Smith] is an excellent source of information. He can also provide you with a variety of before and after pictures of patients he has treated.

An orthopedic surgeon skipped the formalities of a public relations intermediary and had his nurse write this letter to the same medical editor:

Dear [Journalist]:

I am writing to request that [you] consider publishing an article updating the state of the art of artificial hip joint replacement. A new prosthesis has been developed which requires no cement to fix the prosthesis to bone. In the past 5 years, Dr. [Jones] has presented his findings to the American Academy of Orthopaedic Surgery and feels that the impact of this procedure within the medical community is too great an advancement in hip replacement surgery for it not to be made available to the general public. Should [you] feel this is a subject which would interest [your] readers, Dr. [Jones] would be available for an interview.

Universities. A small number of universities have retained public relations firms to disseminate their faculty’s research; most universities continue to handle their own public relations, but many have adopted an increasingly assertive posture. One journalist assessed the phenomenon this way:

I am a little horrified at the intensive public relations that now goes on by

academic institutions, and by others, all seeking to get their research before the public. One reason for this, I suppose, is the shortage of funding, so it becomes more critical than ever to get publicity. But my reaction to these phone calls is, "Why are they calling me?" I mean, if it is really that important, why aren't they getting it published in the journals first? . . . Some of it is quite worthwhile, I wouldn't want to denigrate it. But on the other hand, should science news be disseminated by PR?

The intensity of these various efforts to publicize research has reached such a fever pitch that it threatens to alienate the press. A science writer at a wire service described the extent of the deluge:

We are inundated with too much information from too many institutions, all of them pushing their particular scientists and their work. I get easily five to ten times more mail than any other reporter in our office. Some weeks—I did a couple of informal surveys—I got 400-500 pieces of mail, not counting the twenty journals a week.

The consequences of this barrage of publicity are not always trivial. I would like to cite in detail a case in which actions taken within the scientific community distorted the news and misled the public in a particularly unfortunate way. The case involves recent research on Alzheimer's disease.

Alzheimer's disease became a "hot" story in the fall of 1984. On October 2, five weeks before the presidential election, Health and Human Services Secretary Margaret Heckler announced five new federal grants creating centers for research on the disease. Prior to this, on August 24 and September 7, *The New York Times* carried page-one stories on new developments in Alzheimer's research. When media interest in a topic gains momentum, reporters begin to track it. Further developments have a higher probability of being reported, both because they are noticed and because it is assumed that the public's attention is on the topic.

It was in this climate that researchers at an academic medical center in New England published the results of a preliminary feasibility trial of a potential therapy for Alzheimer's. Their paper appeared in the October issue of *Neurosurgery*. The therapy consists of implanting into the abdomen a pump which continuously supplies a drug, bethanechol chloride, to the patient's brain through a catheter inserted under the skin. The drug is believed to mimic the action of acetylcholine, a neurotransmitter which Alzheimer's victims lack.

The published study involved only four patients and relied solely on subjective measures of efficacy, which consisted of reports by patients' families. The study was not double-blind; researchers were aware—although patients and their families were not—of when a placebo was being substituted for the experimental drug. "At the time of pump refills," the authors wrote, "family members were questioned regarding the patient's cognitive, social, and emotional function over the previous three

weeks. They were also asked to compare the patient's overall functional status to preimplantation function. If family members reported an improvement in overall status during single-blind drug infusions and a return to base line during placebo infusions, this was accepted as a positive subjective response."

The authors' presentation of their therapeutic findings is reproduced in its entirety below:

As the present study was a preliminary feasibility trial done in a single-blind fashion, any results must be interpreted cautiously. Nonetheless, based on the reports of family members observing the patients in their day-to-day activities, the response to bethanechol infusion has been encouraging. We have had repeated reports of decreased confusion, increased initiative, and improvement in activities of daily living (such as household functions, personal hygiene, and social interactions) during drug infusion and a return to base line function with placebo. Perhaps most encouraging is that no family member reported an improvement in overall function during placebo infusion. A double-blind placebo-controlled crossover trial in conjunction with our Department of Psychiatry is presently underway to evaluate therapeutic response in a more objective fashion.

In an editorial "Comment" which appeared in *Neurosurgery* immediately following the paper, a reviewer stated: "This article is certainly a preliminary report and could have benefited from the utilization even in this preliminary study of some of the standardized assessment scales of mental functioning that are available to support the assertions of family members that the patients were improved."

Needless to say, no one could fault the investigators for sharing with colleagues in their field the results of a preliminary feasibility trial. However, on October 16, the medical center held a press conference at which the investigators announced their preliminary findings to the American public. In addition, a patient in the study was made available to the press for a series of on-camera testimonials. The investigators' announcement was reported for two nights running on the NBC "Nightly News," on a 9 p.m. NBC "News Digest," NBC's "Today" show, the "CBS Morning News," ABC's "Good Morning America," PBS's "MacNeil-Lehrer Report," the Cable News Network, and in newspapers from coast-to-coast. The research was reported, or stories are in preparation, in *Newsweek*, *McCall's*, *Family Circle*, *People Magazine*, *Vogue*, and *Forbes*.

A number of newspaper headline writers had a field day. Here are some examples: "Alzheimer's Treatment Found Successful;" "Scientists Find First Breakthrough Against Alzheimer's;" and "Researchers Believe Treatment For Alzheimer's Disease is Near."

The Boston *Globe's* coverage consisted of a U.P.I. story, which ran under the headline, "Researchers describe possible Alzheimer's cure." The story, on page 7, began: "[R]esearchers said yesterday that preliminary experi-

ments indicate they may have found the first effective treatment for Alzheimer's disease." The U.P.I. quoted one of the researchers as stating, "The information we have is subjective and very early. . . . We could have, possibly, inadvertently influenced the family when we asked the questions because we knew whether the patient was getting the drug."

Despite such qualifying language, the medical center was deluged with telephone calls, initially hundreds per day. According to figures compiled by the institution's public information office, approximately 2,600 calls had been received by December 14. Forty percent of callers identified a specific media source. Callers sought to have their afflicted relatives participate in the study, and many offered modest financial contributions. One man flew in from California with his wife, an Alzheimer's victim. Despite her ineligibility for the study, the man wrote a check on the spot for \$10,000, which the medical center accepted.

Members of the medical center's public information staff say that the intensity of the media and public response was unanticipated. Prior to their decision to hold a press conference, the staff had received inquiries about the research from three national news organizations—"The MacNeil-Lehrer Report," Newsweek, and Cable News Network (CNN). "The MacNeil-Lehrer Report" had learned of the work from a scientist unconnected to the study; Newsweek had been tracking the story since summer, when a reporter learned of it at a scientific conference; and CNN was apprised of the work by a press representative of the medical center. "The MacNeil-Lehrer Report" was scheduled to send a camera crew on October 16, and the public information staff was concerned about alienating local media by not apprising them of the story. This led to an institutional decision to hold a press conference coinciding with the visit by MacNeil-Lehrer. To implement this decision, a press officer alerted local newspapers, the wire services, and local network affiliates. On the day of the press conference, the U.P.I. sent an early morning advisory to its clients alerting them to the story. The U.P.I. advisory transformed the story into a national media event, with all three commercial networks sending camera crews. The advisory distorted what the investigators had accomplished, as did the press release which was later distributed to news organizations.

Although the press release stressed the "preliminary" nature of the research and was accompanied by the published paper, it failed to mention the limited number of patients in the study and failed to identify, much less explain, any of the study's limitations. In its omission of important information, it typifies many institutional press releases, according to reporters. To the credit of the public information staff, they did distribute the complete published paper which, according to reporters, is often not done.

This case illustrates serious issues. Many news organizations have not

developed adequate criteria (even informal ones) for evaluating when a science story has achieved a minimal threshold of validity. Clearly, in this instance, the competitive force in journalism prevailed (though not everywhere—*The New York Times*, for example, evaluated the story and declined to run it). While the press can be faulted, however, I would argue that the major responsibility in this instance rests with the scientific institution of high repute which called the press conference. It is difficult to justify announcing to the public the results of a feasibility study involving four patients—particularly when doing so is likely to raise false or premature hopes among families which have been devastated by a ravaging disease. In response to inquiries received from “The MacNeil-Lehrer Report” and Newsweek, the investigators could have declined to talk with reporters pending further evaluation of efficacy. Instead, they sent two conflicting messages to the press. On the one hand, the investigators stressed to reporters the highly preliminary status of their work. Contradicting that message, however, was the decision to hold a press conference—an institutional decision which signaled that there was something important to tell the public. The act of calling the press conference far outweighed in impact the modulating effect of the investigators’ qualifying language, and the story took on a life of its own. Moreover, the visual impact of the patient’s on-camera testimonials all but guaranteed that TV coverage would oversell the research, despite any qualifying language which made it into the story.

Despite such episodes as described above, the overall quality of news stories written by experienced science reporters is better than might be expected. At the negative end of the spectrum, a small fraction of stories exploit the public’s fears and hopes. At the other end of the spectrum, another small group of stories are incisive, penetrating, and frequently brilliant examples of reporting and writing. Included are stories in which journalists, through independent reporting, explore the cutting edges of research, assess important policy matters, or bring new issues to the public agenda. Also included are competitive news stories, written under deadline, which explain with great clarity the nature of complex developments or disputes in research or public policy. The work of some reporters consistently ranks in this top group.

The large remaining fraction of stories consists primarily of routine news reports based on information put out or promoted by sources—be it in a report released by a government agency; a paper published in a leading journal; a press conference called to announce new research findings; or an exchange of charges and countercharges between environmental groups and industry. By and large, these stories accurately report who said what, but they often fail to provide sufficient context.

This lack of context stems, in large part, from constraints on time and space, but also from what I would suggest is an inappropriate application

of the “news” model. The media’s preoccupation with what is “new” –which, after all, is what journalism is all about–may work well as a technique for informing people in areas such as sports and politics, because the press tends to stay with stories in these fields on a regular (even daily) basis. Hence, the writer can safely assume prior knowledge on the part of the reader or viewer. But science news is different. With the occasional exception of a major, ongoing story, science news is scattershot. A particular line of research may make the news once or twice a year, or even less. Despite this, science stories often provide little or no context. Rather, the reporter presents a fragment of new information in isolation, and the next day moves on to something else.

Recommendations

Overall, science news coverage suffers several additional deficiencies, which are addressed by the following eight recommendations: (1) The specific limitations of a research study should receive greater attention. (2) There should be less reliance on single-source stories, reflecting the bias of an individual scientist. Such stories are frequently misleading. (3) There should be greater emphasis on *trends* in research—that is, on stories which cover a number of recent studies in a particular line of work. (The growing number of weekly science sections carried by newspapers provide increased opportunities for such reporting, but this potential has not been fully realized.) (4) More attention should be given to important, socially relevant areas of research which are currently neglected by the media—applied chemistry, for example. (5) News reports of promising advances in biomedical research should describe and explain the obstacles to clinical application. (6) Stories on disputes over health risks should illuminate the different underlying assumptions—both scientific and nonscientific—which account for divergent interpretations of available data. These disputes frequently reflect implicit policy biases, but are often portrayed by the press as disagreements purely over matters of science. As a result, the public is left ignorant of the true nature of the disagreements. A new set of interview questions should be devised to unmask such biases. (7) Reports on health risks should describe the degree of hazard posed by an exposure in relation to other known risks, permitting individuals to weigh the appropriate level of concern. (8) In reporting assessments of the costs, risks, and benefits of technologies—for example, elective clinical procedures—the information should be organized in a way which illuminates the available choices and permits individuals to reach informed judgments.

While adoption of these recommendations would rectify certain deficiencies, other problems would remain. Indeed, the recommendations presuppose that it is possible to qualify one’s remarks and have the quali-

fier stick. However, as Mosteller has pointed out, the fact that a story is deemed by experts to be cautionary or qualified—or to have the right truth—does not tell us what message would be delivered to various audiences.’ We do not know how to properly make qualifications to achieve the kind of impact that the scientist or journalist might desire. Thus, there is a need for more joint social science and journalistic research on the impact of information from the consumer’s point of view.⁴

Other initiatives from within science are needed as well. First, it is time to call a halt to the current public relations assault. The best public relations strategy an institution can adopt over the long term is to build a solid reputation among journalists for providing timely access to reliable information. News conferences should be reserved for occasions when the institution plans to release reliable information of compelling interest or importance. Press releases distributed to the national media should contain genuine news or provide useful background; currently, most do neither, according to reporters.

At the level of the individual researcher, greater numbers of investigators should take steps to get to know the science press corps. If a reporter calls you, return the call promptly. If you are asked to comment on another’s work and are privately critical of it, help the reporter formulate interview questions which will unmask the limitations of the research. If you don’t like a news report on your research, call the reporter and complain. If you do like it, call to say that, too. Learn which reporters you can trust and work with. In noncompetitive circumstances, some reporters will delay a story on your research until you are ready for its public release.

And, lastly, bear in mind the reporter quoted earlier who, having “hooked” the reader with a compelling story—Legionnaire’s Disease—is committed to driving home as much useful information as possible. That reporter can use your help.

NOTES

1. For references to previous literature in this field, see Dorothy Nelkin, "Background Paper," in *Science in the Streets: Report of the Twentieth Century Fund Task Force on the Communication of Scientific Risk* (New York: Priority Press, 1984).
2. Journalists interviewed for Harvard media project include: Lawrence K. Altman, *The New York Times*; Jerry E. Bishop, *The Wall Street Journal*; Philip M. Boffey, *The New York Times*; Matt Clark, *Newsweek*; Victor Cohn, *The Washington Post*; Barbara J. Culliton, *Science Magazine*; Donald Drake, *Philadelphia Inquirer*; Fred Golden, *Time*; Daniel Q. Haney, *Associated Press*; Philip J. Hiltz, *The Washington Post*; William Hines, *Chicago Sun-Times*; Michael Janeway, Editor, *The Boston Globe*; Warren Leary, *Associated Press*; Maura Lerner, Senior Producer, MacNeil-Lehrer Report; Victor McElheny, Director, Vannevar Bush Fellowships, M.I.T.; Loretta McLaughlin, *The Boston Globe*; Judy Randal, *New York Daily News*; JoAnn Rodgers, Hearst Syndicate and The Johns Hopkins Medical Institutions; Albert Rosenfield, freelance; Harold M. Schmeck, Jr., *The New York Times*; Walter Sullivan, *The New York Times*; Seymour Topping, Managing Editor, *The New York Times*; Abigail Trafford, *U.S. News and World Report*; Earl Ubell, WCBS-TV; Nicholas Wade, *The New York Times*; and Bill Wheatley, Senior Producer, NBC Nightly News.
3. Frederick Mosteller, Harvard School of Public Health, personal communication.
4. For relevant work on public perceptions of risk, see Baruch Fischhoff, Paul Slovic, and Sarah Lichtenstein, "Lay Foibles and Expert Fables in Judgements About Risk," *American Statistician* 36, no. 240 (1982).