

Will improvements in health journalism improve health literacy?

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Abstract. Today's health care journalists work in a very different environment than those of yesterday. The demand for stories and broadcasts has grown exponentially, and the resources available have shrunk dramatically. While it may therefore be difficult to see how improvements in health care journalism are possible, let alone a way to improve health care literacy, there is an important connection that, if illuminated, could help both fields. To understand the literature on the quality of health care journalism, it is critical to understand the backgrounds of today's health care journalists and the challenges they face. That literature also goes hand in hand with studies of the effects that news coverage has on the public's understanding of health care issues. There are training and educational programs designed to help health care journalists do their jobs better, and this chapter concludes with a discussion of how cooperation between health journalists, physicians, and other stakeholders can lift all boats.

Keywords: Health literacy, health communication, health journalism

1. Introduction

Today's health care journalists in high-income countries are in some ways similar to their health care journalist predecessors. They are doctors-turned-reporters at newspapers and on television. They also are editors with bachelor's degrees in English and journalism. Some of them work in niche publications with specialized audiences, and others work at trade publications with professional audiences.

The environment in which these journalists work, however, has changed dramatically during the past few decades. As is the case across journalistic fields of specialization, particularly politics, news cycles have shortened significantly - and competition for attention has grown exponentially. Journalists do not just worry about scooping each other. They worry about being scooped by non-journalism outlets, and even a story's sources on social media. Meanwhile, journalism resources are being gutted by struggling news media business models.

Against this backdrop, it may seem counterintuitive, or even foolhardy, to explore what we know - and don't - about how improvements in health care journalism could improve health care literacy. By the time scholars have refined their models and knowledge, the argument could go, the state of journalism could be even more precarious. As I will argue in this chapter, however, the two go hand in hand, and making

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the connection between improved health care outcomes and improved health care literacy could provide an important argument for more health care journalism resources. At the same time, conceptual models of health literacy and communication will need to take into account journalism's ever-changing realities.

Section 2 describes the backgrounds of today's health care journalists. Section three explores some of challenges that health journalists face. With this background, section four reviews the literature on the quality of health care journalism while section five examines the current evidence for what effects - if any - news coverage has on the public's understanding of health care issues. Section six describes some educational initiatives designed to remedy some issues facing health journalism. Section seven addresses whether improving health care journalism can improve the public understanding of relevant medical and public health issues. Section eight concludes the chapter with some suggestions for cooperation between health journalists, physicians, and some of the health care delivery system's other stakeholders.

Similar to clinical medicine and health literacy, the field of health journalism is advanced by understanding the experiences of professional practitioners as well as extant research findings. While section three summarizes health journalism practices mostly from the experiences and perspective of contemporary practitioners and section six describes some university and institutional initiatives, sections two, four, five, and seven are more grounded in mass communication and health communication research.

2. Who are today's health care journalists?

In a rare 2005 comprehensive survey of U.S. health care journalists, Viswanath et al. found: "almost 70% of the respondents to our survey had at least a bachelor's degree; 19% reported having a master's degree; 4.5% reported having a doctorate, including about 3% with an M.D. Almost half of the respondents graduated with a degree in journalism and 13% with a degree in communications. Eight percent reported they were 'life sciences' majors in college" [1]. Although two-thirds of those surveyed were women, minorities were not well represented among health care journalists - and both trends remain unchanged.

The nearly 1,500 members of the Association of Health Care Journalists (AHCJ) span the U.S., with a smattering of members in other countries. Freelancers account for a quarter of the organization's members, with more instances of members affiliated with a particular outlet taking on occasional freelance assignments elsewhere. In 2019, members who self-identified as working predominantly online exceeded those who perceive themselves as strictly employed by newspapers. AHCJ's minority membership reached 16 percent for the first time in 2019.

3. What challenges do health care journalists face?

A 2008 study of health news concluded: "media institutions are being affected by critical issues such as new technology, low profits, layoffs, and media fragmentation" [2]. To meet news traffic targets, contemporary health reporters are asked to produce high volumes of stories, sometimes several per day, which does not facilitate in-depth reporting, or context.

According to one journalist laid off in 2008, quoted in a Kaiser Family Foundation report on the state of health care journalism: "the new mantra is that you must do one to two stories a day - I used to do three a week" [3]. In 2009, when the author became executive editor of Reuters Health (a wire service for laypeople and physicians owned at that time by Thomson Reuters), staff reporters were expected to file four or five stories per day, all about clinical studies. Even for seasoned and specialized journalists,

this is a Herculean task. As executive editor, I shifted the expected burden to two stories per day - still a challenge, but as low as I could go and still satisfy clients who needed high volumes to meet their own traffic needs. Otherwise, editors are encouraged to push for headlines that will drive clicks, which can encourage sensationalism and even inaccuracy.

Science sections retreated from almost 100 in 1989 to a third of that by 2005 - a trend that seems to have continued [4]. While some science sections refocused more on health because of the large direct-to-consumer advertising market, the transition cannot make up for the overall loss of editorial space within print health news outlets. The elimination of science sections often goes hand in hand with the eradication of the newsroom jobs that staffed them, although sometimes the stories that appeared in specialized sections migrate to other pages.

In online journalism, the aforementioned distinctions between sections are more confusing. Readers may not differentiate a health story that appears in a newspaper's style section, written by a reporter with little subject matter expertise, from a piece that appears in the paper's science or health section. A newspaper may run a story that is highly critical of a new health craze in one section with another that glorifies a celebrity for his or her efforts to promote the same fad.

In 2009: "forty percent of AHCJ staff journalists who participated in a recent survey said the number of health reporters at their outlet had gone down since they'd worked there, while 16% said it had gone up. And 39% said it was at least somewhat likely that their own position would be eliminated in the next few years" [3]. Working in conditions like these is harmful because it forces everyone to produce more - and anxiety about one's professional future is counterproductive.

In contrast, specialized outlets spring up frequently, driven by technology that allows targeted advertising. Some specialized outlets fall within the category of trade journalism, and many of them publish and broadcast extraordinary and award-winning work. However, specialized health news outlets tend to reach more limited audiences who often are knowledgeable about the subject matter, which makes it unlikely that their content will have a significant effect on public understanding, health literacy, or desired health behaviors. One assessment of journalistic quality among trade sites also recently characterized their reporting as 'misleading' [5].

The journalists who work for trade, legacy, and digital news organizations also are not the only generators of health news about biomedical research. The democratization of publishing, particularly the advent of blogging, means nearly anyone can find an audience. In order to fill their pages, newspapers and online outlets often recruit physician-authors for their blogging networks. Entire sites, such as MassiveSci and The Conversation, are grounded in the concept that it is best to use physicians and scientists (instead of traditional journalists) to communicate directly with readers. While the expertise of clinicians and researchers is welcome (and some of their work has significant impact), the latter trend means a decline in the pool of health writing jobs (and careers) for journalists.

In addition, the shrinking job market is impacted by non-journalism sites such as Futurity.org and ScienceDaily.com - some of them quite well-funded - that publish health press releases. When the author asked some first-year students at New York University to critique stories about scientific papers, several of them sent links to press releases on these or similar sites, not realizing they were produced by the universities or journals involved. Some of this probably stems from journalists who fail to add value with their reporting, thanks to volume demands and other requirements. However, Google and other news search engines categorize these sites in the same way they classify independent journalism outlets, which is misleading.

Even when reporters want to add value to health news research and policy coverage, there are other persistent constraints. For example, news cycles are dramatically shorter, and at the myriad outlets that

seek to capture a share of the public's attention on a particular news event, health reporters often are forced to act without the benefit of time to contextualize findings. Pre-emptive strikes that inhibit thoughtful reporting loom persistently. For instance, one tweet can result in making into "old news" a carefully crafted story a reporter has been working on for days or even weeks. In turn, the time it takes to develop health stories, sources, and understand a biomedical topic well currently are experiencing an unprecedented intra-professional decline.

Health journalists who cover new findings also find themselves at the mercy of research journals who use embargoes - and the Ingelfinger Rule - to control the flow of information. As the author noted previously, the use of embargoes by refereed biomedical journals has changed [6]. While journals once embargoed stories several days in advance (which gave reporters a little time to delve into a subject, interview experts, and write a meaningful story or produce a well-considered broadcast), the current trend is to embargo for much shorter periods [6]. When embargoes (which have grown like kudzu as companies, the government, and even doctors' practices use them) are short, they offer no real advantage to the news audience because reporters have no time to develop stories properly [7].

Paradoxically, the Ingelfinger Rule (which embargos journalists from publishing, at a journal's discretion) undermines public understanding because the process creates the impression that scientific discussions and the diffusion of knowledge mostly occur when journals publish findings. Embargoes force a rushed and contrived episodic process that cultivates a public misunderstanding that breakthroughs are the norm rather than the exception. Overall, the more journalists are pressed for time, their capacity for contextualization and their capacity to counter stereotypes in public perception are jeopardized.

Moreover, the genesis of a persistent (and false public impression) of frequent research breakthroughs is exacerbated by the amount of spin generated within press releases - and sometimes even by the depiction of a study's findings within a journal article [8-10]. While it is tempting to believe spin is the provenance of industry press releases, much of it stems from academic press releases, presumably because 'breakthroughs' are more likely to capture the attention of reporters, which in turn captures the attention of funding agencies and peers [11].

More specifically, Yavchitz et al. found the 'spin' in press releases was associated with presence of 'spin' in the article abstract's conclusion [12]. Similarly, Summer et al. found: "for health and science news directly inspired by press releases, the main source of both exaggerations and caveats appears to be the press release itself" [13]. Schwartz et al. added: "high quality press releases issued by medical journals seem to make the quality of associated newspaper stories better, whereas low quality press releases might make them worse" [14]. A study of coverage in Dutch newspapers came to similar conclusions [15].

The volume of press releases distributed by the largest provider EurekAlert! also means health reporters hypothetically can write several health stories per day without ever having to generate anything new or enterprising. The author has urged mass communication scholars to assess the degree a 2016 inadvertent outage (or lack of access) to EurekAlert! fostered significant changes in interim health news coverage [16].

Some research and practitioner experience suggest press releases have an outsized influence on the quality of health news coverage [17]. For example, Haneef et al. found, "most important factors associated with high online media attention were the presence of a press release and the journal impact factor. There was no evidence that study design with high level of evidence and type of abstract conclusion were associated with high online media attention" [18]. Section five of this chapter discusses attempts to minimize the effects of spin on news coverage.

Finally, many health reporters (similar to the researchers whose work they cover) have been caught blindsided by what is occasionally referred to as the 'replication crisis'. Although many scientific leaders avoid the use of the term 'crisis', because it presumes things are getting worse, there is no question that

many studies are not replicable in preclinical medicine, psychology, and other fields [19,20]. The latter development suggests relying on single studies for news reports makes it highly unlikely that the ensuing reporting is isomorphic with reality. And yet: “journalists preferentially cover initial findings although they are often contradicted by meta-analyses and rarely inform the public when they are disconfirmed” [21].

Hence, the bread and butter of daily health journalism turns out to be a nutrition-poor meal [22]. It would be a great outcome if the replication ‘crisis’ led journalists away from coverage of single studies in an effort to be wrong less frequently.

4. How good (or bad) is today’s health care journalism?

For nearly 13 years beginning in 2005, Health News Review (healthnewsreview.org) critiqued more than 2,500 news stories about health care interventions based on a set of 10 rigorous and consistent criteria ranging from “Does the story adequately discuss the costs of the intervention?” to “Does the story use independent sources and identify conflicts of interest?” The criteria are so insightful that the author asks NYU students to them in a weekly exercise to critique - and rate - current news stories.

In 2008, Gary Schwitzer, the site’s founder, wrote: “after almost two years and 500 stories, the project has found that journalists usually fail to discuss costs, the quality of the evidence, the existence of alternative options, and the absolute magnitude of potential benefits and harms” [23].

Schwitzer and several colleagues repeated and broadened their initial analysis using 1,889 reviews completed between 2005 and 2013. They found: “on average, the stories reviewed during 2005–2010 successfully met just less than half of the criteria, but by 2010–2013, that average had improved to almost 70%. There were significant improvements over time in news organizations’ success in meeting six of HNR’s 10 criteria for a successful health news story related to drugs, devices, surgery and other medical procedures, and diet; however, when data for television stories were excluded, only the improvement in avoiding disease-mongering remained significant. In addition, there was a statistically significant decline in the percentage of stories rated satisfactory on establishing the true novelty of the intervention discussed in the story. There was no improvement in quantification of possible harms from medical interventions” [24].

The latter findings also seem to be partially reinforced by similar health journalism research. In a 2000 study of 207 text and broadcast health/medical stories, “83 (40 percent) did not report benefits quantitatively. Of the 124 that did, 103 (83 percent) reported relative benefits only, 3 (2 percent) absolute benefits only, and 18 (15 percent) both absolute and relative benefits. Of the 207 stories, 98 (47 percent) mentioned potential harm to patients, and only 63 (30 percent) mentioned costs. Of the 170 stories citing an expert or a scientific study, 85 (50 percent) cited at least one expert or study with a financial tie to a manufacturer of the drug that had been disclosed in the scientific literature. These ties were disclosed in only 33 (39 percent) of the 85 stories” [25].

A 2003 study of 193 articles about newly approved drugs in Canada found: “overall, 62% (119/193) of the articles gave no quantification of the benefits or harms. Thirty-seven (19%) of the 193 articles reported only surrogate benefits. Other information needed for informed drug-related decisions was often lacking: only 7 (4%) of the articles mentioned contraindications, 61 (32%) mentioned drug costs, 89 (46%) mentioned drug alternatives, and 30 (16%) mentioned nondrug treatment options (such as exercise or diet)” [26]. Cassels et al. concluded their findings raise: “concerns about the completeness and quality of media reporting about new medications” [26].

Similarly, Wells et al. found: “newspapers tended to overrepresent support for screening mammography for women aged 40 to 49 years” [27]. Screening for breast cancer, of course, has been one of the most fraught issues covered by health care journalists for at least two decades. The results of Wells et al.’s 2001 study, published four years before the inception of Health News Review, led its authors to conclude that “medical journalism may benefit from identification of standards similar to those used for reporting medical research” [27].

Health care reporters, particularly those on short deadlines, additionally tend to rely on a narrow range of sources. In a study published in 2018 that replicated the then 20-year-old Woodhull Study: “nurses were identified as the source of only 2% of quotes in the articles and were never sourced in stories on health policy” [28]. That led its authors to conclude: “nurses remain invisible in health news media, despite their increasing levels of education, unique roles, and expertise”. While the latter findings may be shaped by the fact that nursing is a female-dominated profession and journalists tend to quote men more frequently, a gender skew seems insufficient to explain the study’s overall findings.

There also is some evidence that health news stories which include external comments tend to feature less hyperbole. Bossema et al. found: “the relative odds that an article without an external expert quote contains an exaggeration of causality is 2.6” [29]. While observational in nature, this study still suggests an argument to give reporters more time to find a diversity of opinions.

The net effect of these limitations and resource constraints is that coverage of medical research is often one-dimensional, oversimplified, and fails to provide readers and viewers with the kind of narrative and information that is desirable to improve public understanding about health and medicine. In turn, this begs two questions: if all of the aforementioned limitations impact the behavior of readers and viewers, which is discussed in section four; and what counter-efforts are underway to advance health journalism, which is addressed in section five.

5. Does news coverage influence the public’s health literacy, attitudes, and behavior?

A 2002 Cochrane review found: “despite the limited information about key aspects of mass media interventions and the poor quality of the available primary research, there is evidence that these channels of communication may have an important role in influencing the use of health care interventions” [30].

Cochrane’s conclusion has been reinforced by a handful of studies of specific medical news episodes that occurred before and after the 2002 Cochrane review. For example, a 2000 study linked “a decline of 1.4% in coverage of the MMR vaccine for children in [Wales] who reached their second birthday during the evaluation quarter (July to September 1998)” to “a protracted campaign against the MMR vaccine” in the South Wales Evening Post” [31].

In 2014 a study found: “during the 2009 H1N1 influenza outbreak in Israel, an increase in mass media coverage was associated with an increase in pediatric [emergency department] visits” [32]. And in 2016, Matthews et al. found: “a period of intense public discussion over the risks:benefit balance of statins, covered widely in the media, was followed by a transient rise in the proportion of people who stopped taking statins” [33].

While the former research suggests a preliminary association between news editorial publicity and public behaviors, other research assesses whether news coverage impacts the public’s understanding of how scientific research works. For example, Chang found: “overrepresenting findings with dramatized characteristics has negative implications not only for the target news but also for the scientific community in general” like “loss of interest or trust in science” [34]. Rezbach et al. “found that frank discussions of

uncertainty in stories about research didn't undermine public trust in science", suggesting that readers and viewers appreciate nuance [35]. Bott et. al. found including caveats and limitations within stories did not diminish their news value or interest to lay audiences [36].

Yet, other research about how health policy and other 'non-clinical' news is covered suggests outcome variables should be more comprehensive than changes in public behavior, awareness, or health literacy. For instance, the 2018 reporting of undisclosed conflicts of interest at Memorial Sloan Kettering Cancer Center was followed by the resignation of a top official there, as well as changes to the Center's related policies [37].

The example is part of a trend - there has been an increase in health news stories about research misconduct and fraud, and sexual harassment within research institutions [38–40]. While the latter work by journalists plays a key role in attitudes and potentially even behaviors as they reflect trust – or lack of trust – in our health care system, it is often less assessed (or well-contextualized) in terms of its contributions to scientific integrity and accountability.

An illuminating 2019 Pew Research Center survey provided some possible clues about how news coverage might influence public attitudes about medical practitioners and the underlying findings that guide clinical practice [41]. Pew's findings suggested Americans are not confident that researchers are transparent about potential conflicts of interest as well as skepticism "that those engaged in misconduct routinely face serious consequences". Pew also found: "Americans tend to trust science *practitioners*, who directly provide treatments and recommendations to the public, more than *researchers* working in the same areas" [41].

The latter suggests future studies regarding the mass media's effects on health literacy, public attitudes, and behaviors should incorporate more diverse stories and broadcasts that include coverage of health care policy and the medical research process, rather than just studies about interventions or publicity about a current public health risk. The latter also suggests the outcome variables of research should be broader than increases in public awareness, opinion, and health behavioral inclinations. One framework for such research might focus on the publish or perish incentives that drive so many problematic trends in both science and journalism [42]. The author will return to this theme in section eight of this chapter.

6. What efforts are in place to improve health care journalism?

Fortunately, the flaws in medical journalism have not gone unnoticed by its practitioners, and a number of efforts are underway to improve professional practice. These efforts range from academic programs that offer degrees, to ongoing professional education for working journalists, to organizations that connect researchers to reporters and editors.

The Science, Health, and Environmental Reporting Program (SHERP) at New York University's Arthur Carter Journalism Institute, where the author has taught a medical reporting course since 2002, is one such program. SHERP, which offers graduate journalism degrees, was founded in 1982 in the wake of concerns that science coverage in the mainstream U.S. press was superficial or even wrong. SHERP students typically have some scientific background, from a bachelor's degree to a Ph.D., or work in a research-related role. The 16-month course of study includes everything from newswriting to critical analysis of studies and investigative journalism. Along the way, students intern at leading publications. The program's hundreds of alumni can be found in key roles at many of these publications, with regular bylines in The New York Times, Washington Post, and Wall Street Journal, among other top outlets.

Somewhat similar programs have been in place in the U.S. at MIT, and the University of California-Santa Cruz. The journalism programs at the University of North Carolina-Chapel Hill, and the Grady School of Journalism at the University of Georgia focus more on public and personal health than biomedical research reporting.

The Association of Health Care Journalists (AHCJ), of which the author is president at the time of this writing, was founded in 1998 to offer resources, training, and networking to working health care journalists. Its founders recognized a gap in career-long learning, and in the 22 years since, the organization has grown to nearly 1,500 members and a wide - and deep - set of offerings. Those include an annual conference that routinely draws more than 700 attendees, specialized workshops and fellowships on subjects ranging from cancer research to comparative effectiveness research, a busy electronic discussion list used daily to find sources and information, and more. A medical studies topic leader routinely guides AHCJ members through research, and the model of all of AHCJ's offerings is 'see one, do one, teach one', with members generously giving their time to support the work of their peers. AHCJ's annual awards program recognizes the best of the best.

Health News Review represents another effort that strives to improve the state of health journalism. In addition to its thousands of reviews of news stories - and for a few years, press releases - the website included coverage of important issues in health care journalism, and tip sheets on subjects such as avoiding cause-effect language when writing about observational studies. The site's criticisms led several health organizations to change their policies on fundraising and oversight [43]. Regrettably, the end of philanthropic support means healthnewsreview.org is updated only infrequently as of December 2018.

The mission of the Center for Health Journalism, based at the University of Southern California, is to give journalists the resources they need to improve their work [44]. The Center for Health Journalism offers fellowships, including partnerships with media organizations, as well as grants, and helps journalists collaborate on larger projects.

Variations on Science Media Centers also have sprung up around the world. These organizations put together briefings on scientific subjects, often those that are more controversial, and connect vetted experts with reporters who need sources on deadline. While many reporters make use of these resources, as evidenced by the number of media center experts who appear in news coverage, some have expressed concerns that these organizations can limit discussion of problems in science and may be too allied with industry [45]. SciLine, supported by the American Association for the Advancement of Science, is a recent entry with a somewhat different model [46].

While this discussion is not exhaustive, it gives a sense of existing efforts and where gaps might persist. Regarding current gaps, there is a pressing need for programs that work with general interest editors and producers whose purview includes health coverage. Health journalism educational organizations have struggled to engage this group because of the demands on their time and because health care is just one of the diverse socio-professional topics for which general interest news editors are responsible. The influence of general interest editors is especially significant at smaller local and regional outlets that lack specialized reporters.

While progress is evident in the diversity of current initiatives, there are remaining opportunities to assist health journalists at entry to advanced levels.

7. Does improving health journalism really improve public understanding?

While it is not controversial to say that spin provides a negative force in published studies, press releases, and stories and broadcasts, the evidence for the negative *effects* of such spin on the public's understanding of health care news has been assumed to exist, despite a lack of any prospective studies.

In contrast, Boutron has been leading the “first prospective meta-analysis of randomised controlled trials for interpretation of health news items reporting the results of studies with or without spin” [47]. The author is part of this effort, which eventually will comprise 16 randomized clinical trials [47].

As the authors describe in a paper reporting on the first three such trials: “We conducted three two-arm, parallel-group, Internet-based randomized trials (RCTs) comparing the interpretation of news stories reported with or without spin. Each RCT considered news stories reporting a different type of study: (1) pre-clinical study, (2) phase I/II non-RCT, and (3) phase III/IV RCT. For each type of study, we identified news stories reported with spin that had earned mention in the press. Two versions of the news stories were used: the version with spin and a version rewritten without spin. Participants were patients/caregivers involved in Inspire, a large online community of more than one million patients/caregivers. The primary outcome was participants' interpretation assessed by one specific question ‘What do you think is the probability that ‘treatment X’ would be beneficial to patients?’ (scale, 0 [very unlikely] to 10 [very likely])”. We found that “Spin in health news stories reporting studies of pharmacologic treatments affects patients' /caregivers' interpretation”. That was not a surprising result, but the authors felt that empirical evidence - or, had it not been present, the lack of empirical evidence - was important if policy and practice were being shaped [48].

Although there is observational evidence that spin in health press releases is linked to hyperbole in news reports, there has been a dearth of prospective evidence to test the hypothesis that better press releases would improve health news stories. As posted on Twitter, Chambers et al. : “took press releases on health-related science, altered them before they were issued to journalists, and then studied what effect the changes we made influenced science reporting” [49].

Chambers' results, published in BMC Medicine, found: “News headlines showed better alignment to evidence when press releases were aligned (intention-to-treat analysis (ITT) 56% vs 52%, OR = 1.2 to 1.9; as-treated analysis (AT) 60% vs 32%, OR = 1.3 to 4.4). News claims also followed press releases, significant only for AT (ITT 62% vs 60%, OR = 0.7 to 1.6; AT, 67% vs 39%, OR = 1.4 to 5.7). The same was true for causality statements/caveats (ITT 15% vs 10%, OR = 0.9 to 2.6; AT 20% vs 0%, OR 16 to 156). There was no evidence of lost news uptake for press releases with aligned headlines and claims (ITT 55% vs 55%, OR = 0.7 to 1.3, AT 58% vs 60%, OR = 0.7 to 1.7), or causality statements/caveats (ITT 53% vs 56%, OR = 0.8 to 1.0, AT 66% vs 52%, OR = 1.3 to 2.7). Feasibility was demonstrated by a spontaneous increase in cautious headlines, claims and caveats in press releases compared to the pre-trial period (OR = 1.01 to 2.6, 1.3 to 3.4, 1.1 to 26, respectively)” [50].

As relevant as these prospective findings are, they are insufficient to demonstrate that improvements in news stories foster changes in the public's understanding of health, subsequent behaviors, or ensuing changes in public health as community health literacy improves. The future of research should be to initiate the latter types of studies, that by their nature will require a long follow-up which is mindful of some of the macroscopic initiatives suggested below.

8. Where to go from here

With apologies to scholars in health literature and health communication, I will now attempt to place the state of research into the effects of health journalism on health literacy and behavior into the context of a wider conceptual framework that encompasses research into health literacy and science communication.

In many ways, the issues described in the previous section of this chapter parallel efforts in health literacy and science communication. While these two fields have the benefit of decades of prospective scholarship demonstrating that evidence-based, well-tailored information can help audiences become more aware of relevant issues, one discipline – health communication – has found it challenging to show a therapeutic impact of awareness on subsequent health behaviors and clinical outcomes. The few studies that I have cited in this chapter that suggest associations among news exposure, public awareness, and healthy outcomes represent the rare exceptions that someday may prove the rule.

To cite a successful exception, a 2015 JAMA study found in one Maine county, the introduction of “community-wide programs targeting hypertension, cholesterol, and smoking, as well as diet and physical activity, sponsored by multiple community organizations, including the local hospital and clinician” were “associated with reductions in hospitalization and mortality rates over 40 years, compared with the rest of the state” [51]. While the Maine study suggests that health information campaigns can therapeutically impact health behaviors, the study suggests public health information interventions need to be lengthy to generate therapeutic health outcomes.

What typically makes successful efforts even more challenging is the growing evidence of the so-called ‘backfire effect’, where awareness campaigns only bolster non-evidence-based opinions and behaviors. For example, one study of “three potentially effective strategies in vaccine promotion: one contrasting myths vs. facts, one employing fact and icon boxes, and one showing images of non-vaccinated sick children” found “existing strategies to correct vaccine misinformation are ineffective and often backfire, resulting in the unintended opposite effect, reinforcing ill-founded beliefs about vaccination and reducing intentions to vaccinate” [52]. In other words, the attempt to improve health outcomes could be counterproductive within some populations. It should be noted that in political science, an oft-cited study which demonstrated a similar effect was not found to be replicable [53,54].

In contrast to other disciplines that assess public health communication, health literacy researchers have suggested more frequent associations among public exposure to health information, subsequent improvements in health literacy, and improved clinical outcomes. To be clear, many of these improved outcomes occurred within the intervention groups of diverse clinical studies rather than in public health contexts. Yet, some of the suggested therapeutic outcomes even seem to occur without prolonged follow-up, unlike in health communication research. And health literacy is now considered a social determinant of health, which reinforces its importance.

At the risk of oversimplifying with a metaphor, a broad comparison of the research in the two fields suggests while health communication is treating the symptoms of a disease, health literacy may target the underlying cause. In turn, the latter could mean that journalism which helps readers and viewers better understand how to decide what is trustworthy information could improve health literacy, and thereby therapeutically impact health outcomes. Such reporting would include not just the findings of studies, but deeper dives into how science and medicine work, including a look at the incentives - financial and otherwise - that drive so much contemporary research.

As Timothy Caulfield has written: “science hype is a complex phenomenon that involves many actors. And it is, at least to some degree, the result of systemic pressures imbedded in the current incentives

associated with biomedical research” [55]. For that reason, relying on what is published in the peer-reviewed literature may be necessary but it is insufficient. The clinical research literature is constrained by the very incentives and structures that should be the subject of external examination. It is akin to expecting a car with a speed limiter set to 65 miles per hour to accelerate to 85 miles per hour.

The latter view is consistent with how many health journalists tend to see themselves, and what differentiates them from health communicators [56]. Health journalists are often quick to note they are not educators, and their role is instead to hold institutions accountable, and represent the reader and viewer when interviewing sources. Thus, any education or improvement in health literacy that results from journalistic efforts becomes more of a byproduct rather than its initial goal. On the other hand, I am appreciative of any health journalism improvements that impact therapeutic changes in individual and public health.

Given the accelerating constraints on health care journalists, some may argue that it is time to focus more attention on this welcome byproduct and consider ways to boost it, not just because of the obvious benefits for the public but because it provides a greater rationale for health journalism resources.

However, the author suggests a push to define the quality of journalism by how readers and viewers absorb health information could create a risk that reporting on accountability will become further marginalized, just as in-depth reporting has been supplanted by superficial stories that editors, in a never-ending search for traffic, think readers will click on. While this is not an easy set of priorities to balance, I suggest health literacy researchers, health communication scholars, and working journalists find common ground that could benefit all three disciplines.

The metrics for success in such improvement are, to the author’s knowledge, yet to be developed. It is not a matter of measuring comprehension of particular facts or figures, but instead measuring comprehension of how a system works, and what effects the workings of that system can have on its products, and on our health.

And the latter is not the only challenge. Engaging working journalists - a requirement of any effort like this - will be difficult because of the various demands on their time, and the fact that they do not have sabbaticals or research time naturally built in their careers. It might be necessary to create a program that allows journalists to have some time off without forfeiting their employment, much as journalism fellowship programs at universities once supported.

Overall, these efforts seem well worth it for all of health communication’s diverse stakeholders. Arora, Rousseau, and Schwitzer recently argued in *JAMA* that: “bolstering trust in journalism could help strengthen trust in medicine”, suggesting that clinicians also should be added to the mix [57]. The latter authors encourage physicians and health’s other stakeholders to support high-quality health care journalism engage media to amplify and share truthful stories, and actively correct stories that are not accurate [57]. I would add that stakeholders should support reporters who tell the stories of how science and medicine actually work, instead of glorifying breakthroughs, game-changers, and cures.

My hope is just as reporters should focus on studies and developments that matter, rather than superficial studies that simply assess what is easy to measure, researchers can do what is in their power to ensure that their studies focus on the more difficult - but critical - issues that are likely to improve individual and public health. Moreover, these efforts should be of mutual interest to policymakers, funders, and health care professionals.

In the interim, health journalists are standing by.

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