

A Content Analysis of News Coverage of Skin Cancer Prevention and Detection, 1979 to 2003

Jo Ellen Stryker, PhD; Benjamin A. Solky, MD; Karen M. Emmons, PhD

Objective: To analyze newspaper coverage between 1979 and 2003 to understand how print coverage may affect primary and secondary skin cancer prevention in the US population.

Design: Content analysis of 921 skin cancer articles released by the Associated Press during the study period.

Main Outcome Measures: Amount of attention given to primary and secondary prevention practices and to risk communication.

Results: Media attention to skin cancer has not increased since 1986. Neither prevention (31.8% of all sto-

ries) nor detection (24.4% of all stories) received as much attention as treatment (47.0% of all stories). Specific sun protection practices were mentioned infrequently. Dermatologic detection (6.6%) or self-detection (5.5%) of skin cancer was rarely discussed. Risk communication about skin cancer was suboptimal: articles rarely presented absolute and relative risk.

Conclusions: The media pay little attention to skin cancer, and, in general, stories do not contain important educational information. Strategies for generating increased media attention are discussed.

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SKIN CANCER IS THE MOST COMMON cancer in the United States, affecting approximately 1 million Americans every year.¹ Fortunately, skin cancer is highly preventable and treatable. Sun exposure is a significant risk factor for the 3 most common skin cancers (melanoma, basal cell carcinoma, and squamous cell carcinoma)²⁻¹²; hence, the promotion of sun avoidance, use of sunscreens and sun protective clothing, and avoidance of indoor tanning could produce a significant decrease in the incidence of these cancers. Early detection is critical for the optimal management of cutaneous cancers; if diagnosed early through screening, the most common skin cancers are highly curable by surgical removal, with a low probability of metastasis.¹³

Public education of primary and secondary prevention measures should play a vital role in skin cancer prevention efforts. It has been proposed that simple use of sunscreen during childhood could decrease the lifetime incidence of nonmelanoma skin cancer by 78%.¹⁴ Important components of early detection of skin

cancers include regular screening by a dermatologist and skin self-examinations. As a primary source for health information,¹⁵⁻²³ the news media could be a powerful tool for skin cancer prevention and detection education, ultimately decreasing the incidence of skin cancer and reducing the cost and morbidity of treatment in the United States. There is increasing evidence that news coverage affects primary and secondary preventive health behaviors.

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A compelling event, such as a celebrity diagnosis of cancer, can generate substantial news coverage capable of producing temporary changes in health behavior. For example, screening rates increased immediately following the 1974 surgical treatments for breast cancer of former First Lady Betty Ford and of Margaretta "Happy" Rockefeller, the wife of former Vice President Nelson Rockefeller,²⁴ and women reported stronger intentions to get a mammogram after former First Lady Nancy

Author Affiliations:

Dana-Farber Cancer Institute and Harvard School of Public Health (Drs Stryker and Emmons) and Department of Dermatology, Harvard University School of Medicine (Dr Solky), Boston, Mass. Dr Stryker is now with the Department of Speech Communication, University of Illinois at Urbana-Champaign. Dr Solky is now with the Department of Dermatology, Mayo Clinic, Rochester, Minn.
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Reagan's announcement that she had breast cancer in 1987.²⁵ Similarly, colorectal cancer screening rates increased after former President Ronald Reagan underwent surgery to remove an intestinal tumor.²⁶ More recently, news anchor Katie Couric's public crusade to educate individuals about colon cancer after her husband's death, including the live broadcast of her colonoscopy on *The Today Show* in 2000, resulted in increased colonoscopy rates after the program aired.²⁷ Although media attention to celebrities' experiences with disease can stimulate increased public awareness and preventive action, coverage tends to wane in the absence of additional news events, often corresponding with similar declines in health behaviors.

There is also evidence that general media attention to an issue over time can affect long-term secular trends in health behavior. News coverage has been associated with changes in different health behaviors, including discontinued use of intrauterine devices and oral contraceptives,²⁸ discontinuance of aspirin and other salicylates in children,²⁹ smoking cessation and initiation,³⁰ drunk driving,²¹ mammography screening,^{16,31} cocaine use,³² binge drinking,³³ and marijuana use.³⁴ In sum, evidence is accumulating that news media messages, including celebrity experiences with disease and more general disease coverage, affect participation in prevention and detection behaviors.^{24,26,35,36}

The objectives of our study were to conduct a formative descriptive analysis of skin cancer news coverage and to evaluate the context within which primary and secondary skin cancer prevention was discussed. One important contextual factor was how risk was communicated. Perceptions of risk are often an important motivation for adopting preventive behaviors.^{37,38} Although experts have yet to reach a consensus about optimal reporting of risks, there is some agreement about how mass media should communicate cancer risk, including properly contextualizing risk by presenting absolute and relative risk in the same story.³⁹⁻⁴⁶ Although news coverage of other cancer types, particularly breast cancer, has been studied extensively,^{16,22,25,47-52} there are no studies addressing news coverage of skin cancer, to our knowledge. Herein, we review the coverage of skin cancer, speculate about the implications of such news coverage, and suggest considerations for media advocacy efforts.

METHODS

SAMPLE SELECTION

Media coverage was measured using news from the Associated Press (AP). The AP was selected because it is representative of the national news environment, including radio, television, and newspapers.^{32,53,54} The AP is used by more than 6000 broadcast stations and almost 90% of newspapers in the United States.³³⁻⁵⁵ Although the specific content of news stories may vary across media formats as a function of time or space and other institutional normative differences, the topics being covered in newspapers and television are often similar.^{22,23} The AP sets the agenda for newspapers and television, which in turn set the agenda for less traditional news venues, such as magazines or televised news magazine programs.^{32,53,54,56} Therefore,

it can be inferred that the amount of attention paid to skin cancer by the AP is representative of the amount of attention paid to skin cancer by most of the US news media.

The unit of analysis was a story that gave substantial attention to skin cancer, identified using a process of successive filtration. First, using the AP file in the Lexis-Nexis database, an open search term was developed to capture every story that was primarily about skin cancer. Based on formative research we have been conducting, we found that search terms that refer to cancer at least 3 times retrieve 86% of all stories that are primarily about cancer. To be more inclusive, the open search term we used retrieved all stories that twice referred to skin cancer, melanoma, basal cell, or squamous cell. The open search term retrieved 1657 AP stories between 1979 and 2003. Because we analyzed the content of the census of AP skin cancer stories rather than a sample, our results are not estimates of the "true" values; hence, the point values do not require confidence intervals.

CODING INSTRUMENT

Articles were reviewed for their relevance, and 2 coders (J.E.S. and B.A.S.) applied the coding instrument to any article in which skin cancer was given substantial attention. Intercoder reliability was established on a sample of 80 stories; for all variables (including whether an article was primarily about skin cancer), κ was at least 0.70. Of the 1657 articles retrieved by the open search term, 921 (55.6%) paid substantial attention to skin cancer.

MAIN OUTCOME MEASURES

All of the articles were coded as to whether they included information about 1 of 4 primary topics, including celebrity experience, new research, policy, and other. Articles were also coded as to the types of skin cancer discussed, presentation of risk information, and presentation of information related to skin cancer prevention, detection, diagnosis, or treatment. If risk was discussed, articles were coded for the presence or absence of relative and absolute risk and for references to particular risk factors (eg, dysplastic nevi). If prevention was discussed, articles were coded for the presence or absence of specific sun protection behaviors. If detection or diagnosis was discussed, articles were coded for references to dermatologists, skin self-examinations, and detailed information regarding how to perform such examinations.

RESULTS

There was a mean \pm SD of 37.0 ± 15.6 stories per year primarily about skin cancer between 1979 and 2003, although there was substantial annual fluctuation. Skin cancer coverage peaked in 1985 ($n=70$), associated primarily with 2 significant events: (1) Ronald Reagan had a basal cell carcinoma removed from his nose for the second time and (2) scientists discovered that the ozone layer (which shields UV radiation and, hence, helps protect against skin cancer) was diminishing. In contrast, other peaks in coverage (eg, in 1988 and 1997) were not attributable to isolated events but rather were due to the co-occurrence of multiple events during the same year.

Less than half of all stories were dedicated exclusively to one kind of skin cancer (41.0%), most often melanoma (30.0%) (**Table 1**). A much smaller percentage of stories were dedicated exclusively to basal cell carcinoma (6.0%), and virtually none made exclusive or ex-

Table 1. Frequency of References to Cancer Types and Topics Among 921 Skin Cancer Articles

Skin Cancer Reference	No. (%)
Type	
Melanoma only	276 (30.0)
Basal cell carcinoma only	55 (6.0)
Squamous cell carcinoma only	9 (1.0)
Other, eg, Kaposi sarcoma	37 (4.0)
Nonspecific	424 (46.0)
Multiple	92 (10.0)
Topic	
Report of research findings	325 (35.3)
Celebrity experience	299 (32.5)
Policy related	119 (12.9)
Other	178 (19.3)

explicit reference to squamous cell carcinoma (1.0%). The remaining stories that focused exclusively on one cancer were about other forms of skin cancer, such as Kaposi sarcoma. The stories that were not specifically about one type of skin cancer (56.0%) discussed skin cancer more generally (46.0%) or made reference to multiple types of skin cancer (10.0%).

TOPICS

New reports about skin cancer research received the most media attention of the possible topics (35.3%) (Table 1), with a mean±SD of 13.0±6.3 stories per year. Coverage of celebrity experiences with skin cancer was also high (32.5%), with a mean±SD of 12.0±11.3 stories per year. Media attention was particularly high for politicians and their families: many news stories detailed the diagnosis or treatment of Nancy Reagan (1982), Ronald Reagan (1985 and 1995), former President George H. W. Bush (1986), former First Lady Barbara Bush (1990-1991), Ronald Reagan's daughter Maureen Reagan (diagnosed as having melanoma in 1996 and treated until her death in 2001), presidential candidate John McCain (2000), Al Gore and Dick Cheney (when the health records of presidential and vice presidential candidates for the 2000 election were released), and former President Bill Clinton (2000-2001).

Thirteen percent of stories reported information about policy recommendations or guidelines about skin cancer (Table 1). Most of these stories detailed the estimated effect of the depleting ozone layer on skin cancer incidence. Other important policies that received media coverage concerned regulations about the use of indoor tanning lamps, Food and Drug Administration guidelines about the use of sunscreen on newborns, and National Institutes of Health approval of gene therapy research for melanoma. There was a mean±SD of 4.8±5.7 stories per year about skin cancer policy.

The remaining 19.3% of studies (Table 1) were about different topics. Many of these articles were about the dangers of the sun or the importance of skin cancer prevention. There were numerous stories about people with xeroderma pigmentosum, likely reflecting the news media's preference for the unusual given the rarity

Table 2. Frequency of References to Primary and Secondary Prevention Among 921 Skin Cancer Articles

Skin Cancer Reference	No. (%)
Prevention	293 (31.8)
Sunscreen	197 (21.4)
Sun avoidance	167 (18.1)
Protective clothing	115 (12.5)
Avoidance of indoor tanning	36 (3.9)
Detection or diagnosis	225 (24.4)
Examination by a dermatologist	61 (6.6)
Self-examination	51 (5.5)
Warning signs	20 (2.2)

of the disease.⁵⁷⁻⁵⁹ There was a mean±SD of 7.1±4.7 skin cancer stories per year that were not about research, celebrities, or policy.

SKIN CANCER PREVENTION AND DETECTION IN RELATION TO TREATMENT

Despite the importance of safe sun practices for reducing skin cancer incidence, primary prevention was discussed in only 31.8% of skin cancer stories, and secondary prevention (ie, detection) was discussed in only 24.4% of stories (Table 2). In contrast, treatment was discussed in approximately 47.0% of all skin cancer stories. Scant attention was paid to prevention until 1982, when Nancy Reagan had a basal cell carcinoma removed from her upper lip and vowed to avoid the sun in the future. Although prevention was discussed less frequently in stories about policy (16.0%), prevention was mentioned approximately equally in stories about celebrities (23.9%), new research (29.4%), and other topics (30.7%).

PRIMARY PREVENTION

When skin cancer prevention was discussed (n=293) (Table 2), specific sun protection practices were not always mentioned. Approximately 11% (32/293) of the articles about prevention did not mention any of the primary prevention behaviors (minimizing sun exposure, wearing protective clothing, using sunscreen, and avoiding indoor tanning) but rather focused on environmental risks (eg, ozone depletion).

Using sunscreen was the most frequently cited strategy of primary prevention (21.4% of all skin cancer stories and 66.4% of stories discussing prevention) (Table 2). Cited somewhat less commonly was avoiding the sun (18.1% of all stories and 56.5% of prevention stories) and wearing protective clothing to shield the skin from the sun's harmful rays (12.5% of all stories and 38.4% of prevention stories). Avoidance of indoor tanning lamps or tanning beds was mentioned in only 3.9% of all skin cancer stories (12.3% of prevention stories).

SECONDARY PREVENTION

Despite the role that skin cancer warning signs can play in early detection, few articles discussed skin examina-

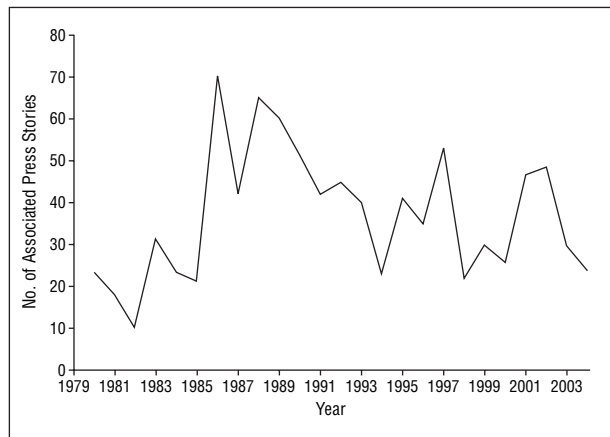


Figure. Media coverage of skin cancer over time.

tions by a dermatologist or by self-examination. Only 6.6% of all stories (27.5% of screening stories) explicitly mentioned screening by a dermatologist, and fewer mentioned skin self-examinations (5.5% of all stories and 21.5% of screening stories) (Table 2). Although passing references to dermatologic examinations or self-examinations were uncommon, it was less likely that secondary prevention stories detailed specific educational information about warning signs for skin cancers (2.2% of all stories and 8.1% of screening stories). For example, of the 36 stories that mentioned self-detection in the context of melanoma, 17 stories reviewed the ABCDs (asymmetry, border irregularity, color variegation, and diameter >6 mm) of self-examination or articulated the warning signs for melanoma. Similarly, only 15.1% (59/390) of articles about melanoma mentioned that moles are a risk factor. Even when moles were mentioned, only 23.7% (14/59) of the articles reviewed the warning signs for melanoma.

RISK COMMUNICATION

Risk was discussed in 45.1% (415/921) of all stories. Discussions of risk included measures of absolute risk and relative risk equally often (60.5% and 56.7%, respectively). However, if one type of risk was mentioned in a skin cancer article, then the other type was significantly less likely to be mentioned: an article that mentioned absolute risk was 84% (odds ratio, 0.17; 95% confidence interval, 0.10-0.26) less likely to mention relative risk than an article that did not mention absolute risk.

COMMENT

This content analysis reveals the lack of media attention to skin cancer in general and to prevention in particular. Despite the fact that skin cancer incidence has been steadily rising in the United States, and has the fastest growing prevalence of all cancer types, media attention to skin cancer has not increased over time (Figure). Although skin cancer is largely preventable, and curable if detected early, primary prevention and secondary prevention are not featured prominently within stories about skin cancer. There was little to no skin cancer coverage

in the early years of the period covered by our analysis. Although there has been an increase in media attention to skin cancer since 1980, current levels of coverage are roughly equivalent to levels from the mid 1980s. To contextualize the amount of media attention to skin cancer, we conducted a similar search for breast cancer coverage. The AP produced more stories in 1 year regarding breast cancer than in 25 years regarding skin cancer. To further contextualize the quantity of skin cancer coverage, we determined that in 2003 the AP released 191 517 stories; 30 of these were about skin cancer.

Although the effect of skin cancer news coverage is unknown, evidence from news coverage of preventive health behaviors and agenda-setting research tells us that increased media attention to skin cancer should increase the likelihood of behavioral effects; that is, more coverage is better. As a primary source for health information, the news media could be a powerful tool for skin cancer prevention and detection education, ultimately decreasing skin cancer incidence and improving prognosis in the United States. It is possible that the lack of media attention to skin cancer is a contributing factor to the low rates of sun protection practices in the United States. A recent national survey of youth aged 11 to 18 years revealed that 72% reported having at least 1 summer sunburn.⁶⁰ A 2003 survey by the American Academy of Dermatology reported that only 34% of people younger than 25 years say that they use sunscreen while outdoors.⁶¹ Ten percent of youth and 8% of their parents reported using indoor tanning sunlamps in the past year.⁶² Few adults from the 1998 National Health Interview Survey reported that they were very likely to perform sun protective behaviors: 23% were very likely to wear protective clothing, 27% were very likely to seek shade, and 30% were very likely to use sunscreen.⁶³ The American Academy of Dermatology's more recent survey revealed that adult sunscreen use rates have not increased since 1998.⁶¹ In addition, the 1998 National Health Interview Survey indicated that only 21% of adults had ever had a skin cancer examination.⁶³

Efforts should focus on increasing the amount of skin cancer media coverage generally and the amount of educational information about specific components of primary and secondary prevention, including sun protection practices and self-detection. It has been hypothesized that media attention to breast cancer is higher than attention to other cancer types because several groups (eg, special interest groups and celebrities) have created a successful mobilization effort.^{22,64} By building such constituencies for skin cancer, forging lasting relationships with news producers, and taking strides to help shape the content of news coverage, a similar mobilization effort could be made for skin cancer. Known as media advocacy,⁶⁵ this strategy holds great promise for catapulting an issue onto the media's agenda. Although media advocacy traditionally focuses on the strategic use of news media to advance a social or policy initiative,⁶⁶ we are applying the term more broadly to include any purposive effort to help shape news coverage to positively affect health.

There are numerous obstacles to garnering and sustaining media attention to an issue over time. There is a limited amount of time and space for health news; hence,

skin cancer coverage must compete with other health issues for room on the media's agenda. Moreover, the media tend to exhibit what has been termed the "issue-attention cycle," whereby any given issue tends to receive substantial media attention for a limited time only, because journalists are motivated to constantly introduce new issues in an effort to maintain the interest of their audiences.⁶⁷ Yet, the historical success of breast cancer lobbying efforts, and more recently of Katie Couric's increasing colon cancer awareness and screening,²⁷ suggests that the media can be mobilized to cover skin cancer. A manual published by the American Public Health Association⁶⁸ provides detailed strategies for media advocacy efforts.

Our content analysis revealed that almost 70% of skin cancer stories were reports of new research or celebrity experiences with skin cancer. Researchers must make themselves available to the news media, serving as a resource to reporters and increasing the likelihood that the content of skin cancer news stories can be shaped by experts. In addition, part of the lobbying effort must include enlisting celebrities to serve as spokespersons for skin cancer prevention and encouraging these celebrities to provide specific prevention messages as sound bites when interviewed. The fact that every president and all but 1 vice president of the United States since 1980 have been diagnosed as having skin cancer suggests that prominent and powerful people might be willing to promote the cause.

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Correspondence: Jo Ellen Stryker, PhD, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 S Wright St, Urbana, IL 61801 (jstryker@uiuc.edu).

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REFERENCES

- National Cancer Institute. Skin cancer (PDQ): screening: health professional version. Available at: <http://www.nci.nih.gov/cancertopics/pdq/screening/skin/HealthProfessional>. Accessed July 19, 2004.
- Armstrong BK, Kricger A. The epidemiology of UV induced skin cancer. *J Photochem Photobiol B*. 2001;63:8-18.
- Spencer JM, Amonette RA. Indoor tanning: risks, benefits, and future trends. *J Am Acad Dermatol*. 1995;33:288-298.
- Zaynoun S, Ali LA, Shaib J, Kurban A. The relationship of sun exposure and solar elastosis to basal cell carcinoma. *J Am Acad Dermatol*. 1985;12:522-525.
- Gallagher RP, Hill GB, Bajdik CD, et al. Sunlight exposure, pigmentary factors, and risk of nonmelanocytic skin cancer, I: basal cell carcinoma. *Arch Dermatol*. 1995;131:157-163.
- Gallagher RP, Hill GB, Bajdik CD, et al. Sunlight exposure, pigmentation factors, and risk of nonmelanocytic skin cancer, II: squamous cell carcinoma. *Arch Dermatol*. 1995;131:164-169.
- Rosso S, Zanetti R, Martinez C, et al. The multicentre south European study 'Helios,' II: different sun exposure patterns in the aetiology of basal cell and squamous cell carcinomas of the skin. *Br J Cancer*. 1996;73:1447-1454.
- Zanetti R, Rosso S, Martinez C, et al. The multicentre south European study 'Helios,' I: skin characteristics and sunburns in basal cell and squamous cell carcinomas of the skin. *Br J Cancer*. 1996;73:1440-1446.
- Zanetti R, Franceschi S, Rosso S, Colonna S, Bidoli E. Cutaneous melanoma and sunburns in childhood in a southern European population. *Eur J Cancer*. 1992;28A:1172-1176.
- Lew RA, Sober AJ, Cook N, Marvell R, Fitzpatrick TB. Sun exposure habits in patients with cutaneous melanoma: a case control study. *J Dermatol Surg Oncol*. 1983;9:981-986.
- Green A, Siskind V, Bain C, Alexander J. Sunburn and malignant melanoma. *Br J Cancer*. 1985;51:393-397.
- Holman CD, Armstrong BK, Heenan PJ. Relationship of cutaneous malignant melanoma to individual sunlight-exposure habits. *J Natl Cancer Inst*. 1986;76:403-414.
- Rowe DE, Carroll RJ, Day CL Jr. Prognostic factors for local recurrence, metastasis, and survival rates in squamous cell carcinoma of the skin, ear, and lip: implications for treatment modality selection. *J Am Acad Dermatol*. 1992;26:976-990.
- Stern RS, Weinstein MC, Baker SG. Risk reduction for nonmelanoma skin cancer with childhood sunscreen use. *Arch Dermatol*. 1986;122:537-545.
- Meissner HI, Potosky AL, Convisor R. How sources of health information relate to knowledge and use of cancer screening exams. *J Community Health*. 1992;17:153-165.
- Yanovitzky I, Blitz CL. Effect of media coverage and physician advice on utilization of breast cancer screening by women 40 years and older. *J Health Commun*. 2000;5:117-134.
- Ward GW, Morrison W, Schreiber G. Pilot study of health professionals' awareness and opinions of the hypertension information in the mass media they use. *Public Health Rep*. 1982;97:113-115.
- O'Keefe MT. The mass media as sources of medical information for doctors. *Journalism Q*. 1970;47:95-100.
- Gutman J. Physicians' exposure to health topics through mass media: an avenue for improving the dietitian's image. *J Am Diet Assoc*. 1977;71:505-509.
- Phillips DP, Kanter EJ, Bednarczyk B, Tastad PL. Importance of the lay press in the transmission of medical knowledge to the scientific community. *N Engl J Med*. 1991;325:1180-1183.
- Yanovitzky I, Bennett C. Media attention, institutional response, and health behavior change: the case of drunk driving, 1978-1996. *Commun Res*. 1999;26:429-453.
- Corbett JB, Mori M. Medicine, media, and celebrities: media coverage of breast cancer, 1960-1995. *Journalism Mass Commun Q*. 1999;76:229-249.
- Rogers EM, Dearing JW, Chang S. AIDS in the 1980s: the agenda-setting process for a public issue. *Journalism Monogr*. 1991;1:1-47. Monograph 126.
- Fink R, Roeser R, Venet W, Strax P, Venet L, Lacher M. Effects of news events on response to a breast cancer screening program. *Public Health Rep*. 1978;93:318-327.
- Stoddard AM, Zapka JG, Schoenfeld ME. Effects of a news event on breast cancer screening survey responses. In: Engstrom PF, Rimer B, Mortenson LE, eds. *Advances in Cancer Control: Screening and Prevention Research*. New York, NY: Wiley-Liss Inc; 1990.
- Brown ML, Potosky AL. The presidential effect: the public health response to media coverage about Ronald Reagan's colon cancer episode. *Public Opin Q*. 1990;54:317-329.
- Cram P, Fendrick AM, Inadomi J, Cowen ME, Carpenter D, Vijan S. The impact of a celebrity promotional campaign on the use of colon cancer screening: the Katie Couric effect. *Arch Intern Med*. 2003;163:1601-1605.
- Jones EF, Beniger JR, Westoff CF. Pill and IUD discontinuation in the United States, 1970-1975: the influence of the media. *Fam Plann Perspect*. 1980;12:293-300.
- Soumerai SB, Ross-Degnan D, Kahn JS. Effects of professional and media warnings about the association between aspirin use in children and Reye's syndrome. *Milbank Q*. 1992;70:155-182.
- Pierce JP, Gilpin EA. News media coverage of smoking and health is associated with changes in population rates of smoking cessation but not initiation. *Tob Control*. 2001;10:145-153.
- Southwell BG, Hornik RC, Fan DP, Yanovitzky I, Lazili P. *Can News Coverage Predict Mammography Use? A Time Series Analysis to Predict Health Behavior Using the Ideodynamic Model*. Acapulco, Mexico: International Communication Association; 2000.
- Fan DP, Holway WB. Media coverage of cocaine and its impact on usage patterns. *Int J Public Opin Res*. 1994;6:139-162.
- Yanovitzky I, Stryker J. Mass media, social norms, and health promotion efforts: a longitudinal study of media effects on youth binge drinking. *Commun Res*. 2001;28:208-239.
- Stryker JE. Media and marijuana: a longitudinal analysis of news media effects on adolescents' marijuana use and related outcomes, 1977-1999. *J Health Commun*. 2003;8:305-328.
- Cates W Jr, Grimes DA, Ory HW, Tyler CW Jr. Publicity and the public health: the elimination of IUD-related abortion deaths. *Fam Plann Perspect*. 1977;9:138-140.
- Viswanath K, Finnegan JR Jr. Reflections on community health campaigns: secular trends and the capacity to effect change. In: Hornik RC, ed. *Public Health Com-*

- communication: Evidence for Behavior Change. Mahwah, NJ: Lawrence Erlbaum Associates; 2002:289-312.
37. Witte K. Putting the fear back into fear appeals: the extended parallel process model. *Commun Monogr.* 1992;59:329-349.
 38. Weinstein ND. The precaution adoption process. *Health Psychol.* 1988;7:355-386.
 39. Maibach E. Cancer risk communication: what we need to learn. *J Natl Cancer Inst Monogr.* 1999:179-181.
 40. Maibach E. Improving cancer risk communication: a discussion of Fischhoff. *J Natl Cancer Inst Monogr.* 1999:14-15.
 41. Arkin EB. Cancer risk communication: what we know. *J Natl Cancer Inst Monogr.* 1999:182-185.
 42. Kreuter MW. Dealing with competing and conflicting risks in cancer communication. *J Natl Cancer Inst Monogr.* 1999:27-35.
 43. Fischhoff B, Bostrom A, Quadrel MJ. Risk perception and communication. *Annu Rev Public Health.* 1993;14:183-203.
 44. Ratzan SC. Cancer risk communication: what we know and what we need to learn. *J Health Commun.* 1999;4:77-82.
 45. Weinstein ND. What does it mean to understand a risk? evaluating risk comprehension. *J Natl Cancer Inst Monogr.* 1999;25:15-20.
 46. Weinstein ND. Why it won't happen to me: perceptions of risk factors and susceptibility. *Health Psychol.* 1984;3:431-457.
 47. Andsager JL, Hust S, Powers A. Patient-blaming and representation of risk factors in breast cancer images. *Women Health.* 2000;31:57-79.
 48. Andsager JL, Powers A. Framing women's health with a sense-making approach: magazine coverage of breast cancer and implants. *Health Commun.* 2001;13:163-185.
 49. Clarke JN. Breast cancer in mass circulating magazines in the USA and Canada, 1974-1995. *Women Health.* 1999;28:113-130.
 50. Marino C, Gerlach KK. An analysis of breast cancer coverage in selected women's magazines, 1987-1995. *Am J Health Promot.* 1999;13:163-170.
 51. Wells J, Marshall P, Crawley B, Dickersin K. Newspaper reporting of screening mammography. *Ann Intern Med.* 2001;135:1029-1037.
 52. Moyer A, Greener S, Beauvais J, Salovey P. Accuracy of health research reported in the popular press: breast cancer and mammography. *Health Commun.* 1995;7:147-161.
 53. Fan DP, Tims AR. The impact of the news media on public opinion: American presidential election 1987-1988. *Int J Public Opin Res.* 1989;1:151-163.
 54. Fan DP. *Predictions of Public Opinion From the Mass Media.* New York, NY: Greenwood Press; 1988.
 55. Fan DP, Brosius HB, Keppinger HM. Predictions of the public agenda from television coverage. *J Broadcasting Electronic Media.* 1994;38:163-177.
 56. Henderson L, Kitzinger J. The human drama of genetics: 'hard' and 'soft' media representations of inherited breast cancer. *Sociol Health Illness.* 1999;21:560-578.
 57. Tuchman G. *Making News: A Study in the Construction of Reality.* New York, NY: Free Press; 1978.
 58. Gans HJ. *Deciding What's News: A Study of CBS Evening News, NBC Nightly News, Newsweek, and Time.* New York, NY: Vintage Books; 1980.
 59. Gans HJ. Deciding what's news: story suitability. *Society.* 1979;16:65-77.
 60. Davis KJ, Cokkinides VE, Weinstock MA, O'Connell MC, Wingo PA. Summer sunburn and sun exposure among US youths ages 11 to 18: national prevalence and associated factors. *Pediatrics.* 2002;110:27-35.
 61. American Academy of Dermatology. New American Academy of Dermatology survey finds people aware of the dangers of the sun, but sun protection not necessarily practiced. Available at: http://www.protectingwhatprotectsyou.com/PressReleases/SunComparison_Rigel.html. Accessed June 25, 2004.
 62. Cokkinides VE, Weinstock MA, O'Connell MC, Thun MJ. Use of indoor tanning sunlamps by US youth, ages 11-18 years, and by their parent or guardian caregivers: prevalence and correlates. *Pediatrics.* 2002;109:1124-1130.
 63. Santmyre BR, Feldman SR, Fleischer AB Jr. Lifestyle high-risk behaviors and demographics may predict the level of participation in sun-protection behaviors and skin cancer primary prevention in the United States: results of the 1998 National Health Interview Survey. *Cancer.* 2001;92:1315-1324.
 64. Casamayo MH. *The Politics of Breast Cancer.* Washington, DC: Georgetown University Press; 2001.
 65. Wallack L, Dorfman L, Makani T. *Media Advocacy and Public Health: Power for Prevention.* Newbury Park, Calif: Sage Publications; 1993.
 66. Wallack L. Improving health promotion: media advocacy and social marketing approaches. In: Atkin C, Wallack L, eds. *Mass Communication and Public Health: Complexities and Conflicts.* Newbury Park, Calif: Sage Publications; 1990:147-163.
 67. Downs A. Up and down with ecology: the "issue-attention cycle." *Public Interest.* 1972;28:38-50.
 68. *Media Advocacy Manual APHA.* American Public Health Association. Washington, DC: American Public Health Association; 2000.