Characteristics of Genetics-Related News Content in Black Weekly Newspapers

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Key Words

African Americans · Black newspaper · Cancer disparities · News

Abstract

Background/Aims/Objectives: The media are an important source of health information, especially for those with less access to regular health care. Black news outlets such as Black newspapers are a source of health information for African Americans. This study characterized media coverage of genetics-related information in Black weekly newspapers and general audience newspapers from the same communities. **Methods:** All health stories in a sample of 24 Black weekly newspapers and 12 general audience newspapers from January 2004 to December 2007 were reviewed for genetics-related stories. These stories were further coded for both journalistic and public health variables. **Results:** Of all health-related stories identified, only 2% (n = 357) were considered genetics related. Genetics-related stories in Black newspapers – compared to those in general audience newspapers – were larger, more locally and racially relevant, and more likely to contain recommendations or action steps to improve health or reduce disease risks and to mention the importance of knowing one's family history. Stories in gen-

eral audience newspapers were more likely to discuss causes of disease, mention genetic testing or therapy, and suggest a high/moderate degree of genetic determinism. **Conclusions:** Black newspapers are a viable communication channel to disseminate findings and implications of human genome research to African American audiences.

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Introduction

The media are an important source of health information, and studies have shown that learning about health through the media can influence individual behaviors [1–6]. There is growing evidence that when there is sufficient individual exposure to health messages in the media, the amount of media attention paid to a particular issue over time can influence long-term secular trends in health behavior, including prevention and detection behaviors [4, 6–10].

For populations with less access to regular medical care (e.g. low-income African Americans), the mass media could be even more critical for disseminating health information. For example, Yanovitzky and Blitz [6] found that physician advice for breast cancer screening was im-

portant for women who had regular access to a physician, but mass communication channels were particularly important for women without such access.

In particular, the mass media are becoming increasingly essential when it comes to the growing amount and availability of information gathered from genetic studies. The implications of disseminating findings from human genome research are now forefront in terms of the general public's access to this information, including the use and interpretation of genetic information; the clinical integration of genetic advances; and the education of researchers, health professionals and the public [11]. As such, the media are likely to be important in shaping public understanding of and attitudes toward genetics-related issues [12].

Studies of media coverage of genomics are few relative to other health-related topics, although the amount of coverage has grown since the onset of the human genome project (HGP) in the US in 2000 [11]. Cappella et al. [13] conducted a content analysis of 20 major newspapers, 3 broadcast news networks and the Associated Press from 1997 to 2003 and found that about 8,000 stories about genetics and health appeared each year. Newspaper and media coverage of genomics is prominent [14], optimistic [15], emphasizes the medical benefits of genetics research [14], and contains characteristics that both scientists and journalists rate as essential for stories of genetic discoveries, such as location of the research and the genetics of the disease-gene association [16]. The coverage includes stories of hope [14], quotes experts to provide context and credibility [14, 17] and depicts geneticists as 'warriors' or 'heroes' [14]. On the other hand, media coverage of genomics can also lack balance [16, 18, 19], as research with positive results may get reported more often than those with negative results [20]. Stories generally frame genetic risk in a deterministic (i.e. causal) versus probabilistic way [12, 19] and may omit facts about genomics research in ways that can lead to misconceptions about the findings [20] or underestimating the influence of non-genetic factors and interactions on disorders [14].

The content, terminology and framing of information about genomics from the media can also influence risk perception and how the public responds to the information. Geller et al. [20] found that coverage on the positive aspects of genetic research fails to mention the length of time between genetic discoveries and availability of treatments based on those findings, and coverage on the negative aspects may result in fear among the public. Tambor et al. [18] surveyed over 400 Maryland residents to assess their reactions to an announcement that the HGP was

nearing completion of the mapping of the human genome. Less than half (47%) of the initial reactions to the announcement were exclusively positive, 21% of respondents were exclusively negative and 23% were neither positive nor negative. Positive reactions included the HGP's potential to prevent or treat disease, while negative comments included those with religious concerns and ethical concerns such as invasion of privacy. However, when these reactions are stratified by race (Caucasian/other vs. African American), African Americans were 3 times more likely (OR = 3.05; $p < 0.05$) than Caucasians to have at least a partially negative response regardless of education level. Their reactions were more often religious in nature and illustrated a general mistrust of science. These studies and others have suggested that genetic communication efforts should consider cultural as well as local perspectives in order to increase awareness [21].

Therefore, communication strategies should consider a differential understanding of the relationship between genes and behavior [22, 23], different genetic literacy levels [24] or knowledge about genetics [25] among population subgroups when developing educational messages. In addition, local and targeted population media are important to consider in the development of communication strategies. News outlets and their reporters vary widely in the way they shape their stories on genetics and race [26]; yet, content analyses of news stories on genetics information or terminology have not examined these alternative news sources such as Black newspapers [26–28].

Black newspapers are an important media source that has a predominantly Black audience and/or whose content specifically targets Black populations [29, 30] and are an important source of health information for African Americans. Black newspapers have historically served as an important alternative to general audience newspapers for African American readers [31–33]. They provide a mechanism for public dialogue within Black communities, serve as a counterpoint to negative representations of African Americans often found in general population papers [31–33] and are an outlet for stories of unique interest or concern to Black communities [30, 32, 33].

Although Black newspapers' reach is much lower than that of general population news media, they do serve a large proportion of the US Black population. Trade organizations such as the National Newspaper Publishers Association (the 'Black Press of America') and others report there are over 200 Black weekly newspapers in the US, with a combined circulation of approximately 6–19 million [34, 35]. Because most Black newspapers are free and widely accessible, they are often passed on to others

[36], suggesting that reach is likely higher than published circulation numbers. Studies have shown that African American media sources are trusted, preferred and valued by Blacks [32, 36]. National surveys of African Americans also indicate that health stories in Black newspapers are regularly read by a majority of readers [32]. Lack of information or misconceptions about cancer or genetic risk persist and must be addressed to begin reducing cancer disparities that exist among Blacks and others. Increasing attention to these issues through Black media, a trusted source of health information, may be a valuable tool for cancer education efforts.

This study expands upon previous research by characterizing media coverage of genetics-related information in a sample of Black weekly newspapers and compares this coverage to a sample of general audience newspapers from the same communities. Because the news media are an important channel for disseminating information to the general public, identifying how journalists and scientists report genetic research findings to population subgroups like African Americans via Black and mainstream media is also necessary to help improve public awareness and understanding of genetics [37]. This study will address 2 research questions:

(1) What proportion of health news coverage in Black weekly newspapers and general audience newspapers is devoted to genetics-related stories?

(2) How do characteristics of genetics-related stories differ in Black weekly newspapers compared to those in general audience newspapers?

Methods

Sample of Newspapers

To construct our sample of newspapers, we first established a sampling frame that included 2 types of communities: large US cities and standard metropolitan areas. From these, we identified those that had: (1) cancer mortality rates for African American men or women that exceeded US rates for African Americans, and (2) a local Black newspaper. We then sorted the communities in descending order of Black newspaper circulation and chose the top 12 communities from large US cities and 12 from standard metropolitan areas.

These 24 communities represented 16 different states with weekly Black newspapers. We then randomly selected 6 of the 12 communities chosen for each type of community (12 in total) to also include their general audience newspapers. We identified the largest circulation Black weekly and, if selected, the daily general audience newspaper in each community, and these 24 Black weekly newspapers and 12 general audience newspapers comprise the sample. Further details of the sampling of communities and newspapers have been previously reported [38].

We further applied a tested constructed week sampling approach [39, 40] to each community's daily general audience newspaper in order to increase the efficiency of the analysis. Constructed week sampling is a way to approximate content for a larger set of daily newspaper data. Constructed week sampling creates a one-week sample from a longer amount of time such as a month's worth and takes into consideration the daily (Monday, Tuesday, etc.) variation in news content. For each month in our 3-year period for each community's newspaper, we constructed one total week: one Monday, one Tuesday, etc. for manual content analysis.

We obtained subscriptions to all Black and general audience newspapers in the final sample and received the hard-copy issues by mail. Trained research assistants reviewed each Black newspaper issue and each general audience newspaper issue (after constructed week sampling) to identify all health stories. All health stories published in these print-edition newspaper issues from January 2004 to December 2007 were identified and content analyzed. These dates coincide with a larger study for which these newspaper data were originally collected.

The coding data were entered via FileMaker Pro [41]. These quantitative and textual data were then transferred into SPSS v.20 for analysis.

Identifying Genetics-Related Stories

Each Black newspaper ($n = 4,511$ issues) and general population newspaper ($n = 5,332$ issues) comprising the constructed week was read in its entirety to identify eligible stories. *Health-related* stories were those pertaining to health promotion, wellness, disease prevention, well-being, lifestyle, and any mental, physical or spiritual aspects of health. *Cancer-related* stories contained cancer key words (e.g. cancer, tumor) within the headline or first 2 paragraphs. Inter-coder reliability for story identification was high (mean kappa = 0.87).

We identified genetics-related stories using a 2-step approach. First, we identified all health- and cancer-related stories that included genetics or family history as a risk factor for disease. Second, we conducted a key word search of the headlines and leads (i.e. first sentence) of all health- and cancer-related stories that included all variations of 'genetics' (e.g. genes) and 'genomics' (e.g. genome).

Coding Genetics Stories

Identified genetics stories were then coded for both journalistic and public health variables by trained research assistants (see table 1 for variable definitions and measurements). These variables were compiled from existing and previous content analyses of genetics and other health topics [36, 38, 42, 43]. The coders established individual coding reliability by examining the same 10% sample of stories. Once they achieved reliability, they were allowed to code individually. Inter-coder reliability measured as Krippendorff's alpha averaged 0.81 across all variables.

Results

A total of 17,172 health-related stories in our sample of Black and general population newspapers were identified by trained research assistants. Of these, 357 stories (2% of all health stories) addressed genetics or family his-

Table 1. Content analysis variables and definitions

	Measurement	Definition
Journalistic variables		
Genetic headline content	Yes/no	Genetic-related keywords in the headline
Relevance to African Americans	Yes/no	Story contained information relevant to African Americans
Stories with no racial relevance	Yes/no	Story contained information not specific to a racial or ethnic group
Average size	in ²	The average of the sum of the in ² of text in a story, not including headlines or graphics
Visual elements	Yes/no	Story included photographs or other graphics
Localized information	Yes/no	Story contained details, facts or information from or about an individual, organization, community, or other social or political unit that makes the story relevant to the newspaper's local audience
Location of story	Above fold/below fold	Story appeared above or below the fold
Framing of the overall story	Progress/disparity/neutral	How the story was to the readers. Stories framed as 'progress' were typically characterized by new treatments, lower disease rates, better prevention, etc.; 'disparity' stories by comparison between groups, higher disease rates, etc.; and 'neutral' stories usually had no comparison between groups and did not specify any kind of progress or positively framed messages
Story source	Wire or staff reporter/ both wire and staff/ other/cannot tell	The author of the story <ul style="list-style-type: none"> • <i>Wire</i> is written by a reporter from wire services such as Associated Press • <i>Staff</i> is a member of the newspaper's reporting staff • <i>Both</i> is when a wire service reporter and staff writer collaborated to write the story • <i>Other</i> is from a freelance writer • <i>Cannot tell</i> is when no source is listed or if the source cannot be determined
Public health variables		
'Genetics' mention	Yes/no	Story mentioned the term 'genetics'
'Family history' mention	Yes/no	Story mentioned the term 'family history'
Degree of genetic determinism	High/moderate/ little to no/cannot tell	Story attributed the health outcome to a gene only, a gene and other factors or explicitly opposes assignment of causal influence to genes
Genetic information based on ancestry	Yes/no	Story used the term 'family history' in relation to genetics terms
Genetic testing	Yes/no	Story mentioned genetic testing
Genetic therapy	Yes/no	Story mentioned replacing, manipulating or supplementing nonfunctional genes with healthy genes
Genetic counseling	Yes/no	Story mentioned providing information and support to individuals or families who have genetic disorders or may be at risk for inherited conditions
Importance of knowing family history	Yes/no	Story mentioned the importance of one knowing or learning his/her family history
Cancer stories	Yes/no	Story had cancer as the predominant subject of the news story
Cancer site		The location(s) of cancer discussed in the story, e.g. colon, lung, breast, etc.
Story focus		
Prevention	Yes/no	Story, as a whole, focused on activities, specific strategies or programs aimed at deterring a disease before it occurs
Diagnosis	Yes/no	Story focused on identifying cancer or other diseases by its signs or symptoms
Risk factors	Yes/no	Story focused on something that may increase the chance of developing a disease, including age, eating habits, smoking, a family history of certain cancers, etc.
Treatment	Yes/no	Story focused on cancer treatments such as surgery, chemotherapy, radiation therapy, etc.
Screening	Yes/no	Story focused on early detection and prompt treatment of disease
Survivorship	Yes/no	Story focused on the consequences of living with the disease, being diagnosed with the disease, a mention or portrayal of a cancer survivor or of cancer survival
Causes	Yes/no	Story focused on the possible or probable causes of the disease
Surveillance	Yes/no	Story focused on the incidence, prevalence or mortality rates and data and whether those rates have increased or decreased

Table 1 (continued)

	Measurement	Definition
Personal mobilization	Yes/no	Story identified explicit recommendations to improve one's own health
Community mobilization	Yes/no	Story identified explicit recommendations to improve the community's health
Prevention information	Yes/no	Story mentioned a specific activity/activities a person can practice to reduce or prevent his/her chances of developing a disease
Personal efficacy	Yes/no	Story included information encouraging the reader to do something to help him/herself
Response efficacy	Yes/no	Story included information about what can be done to overcome a particular threat
Screening efficacy message	Yes/no	Story included information that provides action-oriented language on how the reader can get cancer screening
Accuracy of screening recommendations	All accurate/all inaccurate/both accurate and inaccurate	Degree to which the recommendations, if any, in the story were consistent with those published in the Guide to Clinical Preventive Services by the US Preventive Services Task Force
Disparities information	Yes/no	Story reported differences in the incidence, prevalence, mortality, and burden of diseases between population subgroups
Recommendation for high-risk population	Yes/no	Story mentioned a screening recommendation that is different if the person has a family history of the disease
Medical mistrust	Yes/no	Story included a sentiment of medical and/or scientific mistrust or skepticism
Referral to resources	Yes/no	Story had detailed contact information for obtaining cancer-related resources

tory as a risk factor or contained key words related to 'genetics' and 'genomics' in the headline or lead of the story. Of these genetics-related stories, 72.5% were in Black newspapers ($n = 259$), and 27.5% stories ($n = 98$) were in general audience newspapers.

Journalistic Variables

Genetics-related stories in Black newspapers were, on average, larger than those in general audience newspapers (36 vs. 26 in², $p < 0.001$). Genetics stories in Black newspapers were also significantly more likely to have at least one visual element (42 vs. 27%, $p = 0.008$), contain localized information (19 vs. 8%, $p = 0.013$), and mention relevance to African-Americans (58 vs. 8%, $p < 0.001$). In contrast, genetics stories in general audience newspapers were more likely to contain the term 'genetics' in the headline (59 vs. 16%, $p < 0.001$), and have no relevance to specific racial/ethnic groups (86 vs. 42%, $p < 0.001$). When examining framing of the overall story, genetics stories in Black newspapers were more likely to utilize a disparity frame (58 vs. 15%), whereas stories in general audience newspapers were more likely to have a neutral frame (85 vs. 41%, overall $p < 0.001$). Black and general audience newspapers also significantly differed in the source of stories. Most often the source, if one was identified, was neither a wire nor staff reporter for Black news-

papers, and for stories in general audience newspapers, the source was a wire service ($p < 0.001$). There were no significant differences between stories in the 2 types of newspapers on the likelihood of being above the middle fold of the paper (table 2).

Public Health Variables

Genetics-related stories in general audience newspapers were more likely than those in Black newspapers to contain the term 'genetics', while stories in Black newspapers were more likely to contain the term 'family history' (both $p < 0.001$). Genetics-related stories in the 2 types of papers differed on their degree of genetic determinism. Those in Black newspapers had a moderate degree of genetic determinism; less than 10% had a high degree of genetic determinism. In contrast, over one-fourth of stories in general audience newspapers had a high degree of genetic determinism (overall $p < 0.001$).

Genetic testing and genetic therapy were mentioned more often in stories in general audience newspapers (testing: 16 vs. 6%, $p = 0.002$; therapy: 9 vs. 1%, $p < 0.001$), though infrequently overall. However, stories in Black newspapers were over 3 times more likely to contain a recommendation for high-risk populations (27 vs. 8%, $p < 0.001$). Stories in Black newspapers were also more likely to mention the importance of knowing one's fam-

Table 2. Characteristics of genetics stories in Black and general audience newspapers

	Black newspapers n = 259 stories	General audience newspapers n = 98 stories	p
Journalistic variables			
Has term 'genetics' in headline	41 (15.8)	58 (59.2)	<0.001
Has relevance to African Americans	151 (58.3)	8 (8.2)	<0.001
Has no racial relevance	108 (41.7)	84 (85.7)	<0.001
Average size in in ² ± SD	36.0 ± 19.7	26.0 ± 20.1	<0.001
Has at least one visual element	108 (41.7)	26 (26.5)	0.008
Has localized information	49 (18.9)	8 (8.2)	0.013
Story location above fold	201 (77.6)	73 (74.4)	0.433
Framing of the overall story			<0.001
Progress	1 (0.4)	0	
Disparity	151 (58.3)	15 (15.3)	
Neutral	106 (40.9)	83 (84.7)	
Story source			<0.001
Wire	48 (18.5)	58 (59.2)	
Staff reporter	36 (13.8)	25 (25.5)	
Both wire and staff	0	2 (2.0)	
Other	67 (25.8)	9 (9.2)	
Cannot tell	105 (41.0)	3 (3.1)	
Public health variables			
Has a mention of 'genetics'	101 (39.0)	86 (87.8)	<0.001
Has a mention of 'family history'	177 (68.3)	43 (43.9)	<0.001
Degree of genetic determinism			<0.001
High	24 (9.3)	28 (28.6)	
Moderate	174 (67.2)	54 (55.1)	
Cannot tell	60 (23.1)	16 (16.3)	
Has genetics info based on ancestry	29 (11.2)	18 (18.4)	0.074
Has a mention of genetic testing	15 (5.8)	16 (16.3)	0.002
Has a mention of genetic therapy	3 (1.2)	9 (9.2)	<0.001
Has a mention of genetic counseling	5 (1.9)	3 (3.1)	0.519
Mentions importance of knowing family history	19 (7.3)	0	0.006
Cancer as main topic	226 (87.2)	48 (49.0)	<0.001
Cancer site (n = 226 for Black, n = 48 for general audience)			<0.001
Breast	85 (37.6)	20 (41.7)	
Prostate	57 (25.2)	7 (14.6)	
Colon/rectum	45 (19.9)	3 (6.3)	
Lung/bronchus	5 (2.2)	5 (10.4)	
General cancer	14 (6.2)	5 (10.4)	
Other sites	20 (8.8)	8 (16.7)	
Story focus			
Diagnosis	183 (70.7)	38 (38.8)	<0.001
Risk factors	190 (73.4)	56 (57.1)	0.003
Surveillance	204 (78.8)	56 (57.1)	<0.001
Treatment	183 (70.7)	67 (68.4)	0.674
Screening	179 (69.1)	32 (32.7)	<0.001
Causes	76 (29.3)	46 (46.9)	0.002
Survivorship	61 (23.6)	13 (13.3)	0.032
Prevention	128 (49.4)	30 (30.6)	0.001
Has personal mobilization	123 (47.5)	6 (6.1)	<0.001
Has community mobilization	41 (15.8)	2 (2.0)	<0.001
Has prevention information	27 (10.4)	2 (2.0)	0.003
Has any personal or response efficacy	147 (56.8)	9 (9.2)	<0.001
Has a screening efficacy message	23 (8.9)	0	0.002
Accuracy of screening recommendations			
All accurate recommendations*	31 (26.5)	3 (27.3)	1.000
All inaccurate recommendations*	58 (49.6)	3 (27.3)	0.212
Both accurate and inaccurate recommendations*	28 (23.9)	5 (45.5)	0.150
No screening recommendations	142 (54.8)	87 (88.8)	<0.001
Has disparity information	173 (66.8)	23 (23.5)	<0.001
Has recommendation for high-risk populations	69 (26.6)	8 (8.2)	<0.001
Mentions medical mistrust	14 (5.4)	1 (1.0)	0.065
Has a referral to resources	95 (36.7)	7 (7.1)	<0.001

Percentages are given in parentheses. * Percentage of stories containing screening recommendations (n = 117 for Black, n = 11 for general audience).

ily history (7 vs. 0%, $p = 0.006$) and marginally more likely to mention mistrust of the medical community (5 vs. 1%, $p = 0.065$).

There were no differences between genetics stories in Black and general audience newspapers in mention of genetic counseling and having genetics information based on ancestry. However, only 8 total stories in the sample mentioned genetic counseling, and 47 included ancestry information.

While all of the identified genetics-related stories contained genetics key words or identified genetics as a risk factor for disease, for both types of newspapers, more of these stories had cancer as the main topic than any other health topic. For Black newspapers, 87% of stories were about cancer, compared to 49% of those in general audience newspapers (overall $p < 0.001$). For those genetics-related stories that were primarily about cancer, the cancer type with the most coverage was *breast* (38% for Black vs. 42% for general audience), followed by *prostate* (25 vs. 15%, respectively) and *colon/rectum* (20%) for Black papers and *lung/bronchus* (10%) for general audience papers.

Genetics-related stories in Black newspapers mostly focused on diagnosis (71% of stories), risk factors (73%) and surveillance (79%), and all were significantly more than stories in general audience newspapers (all $p < 0.01$). In contrast, stories in general audience papers were more likely to focus on *surveillance* (57%) and *treatment* (68%), though only *causes* was significantly greater than in Black newspapers (47 vs. 29%, $p = 0.002$).

Genetics-related stories in Black newspapers were almost 3 times as likely as general audience papers to contain disparity information (67 vs. 24%, $p < 0.001$). While prevention was not a common focus of the stories, information about prevention was more than twice as likely to appear in Black newspapers (10 vs. 2%, $p = 0.003$). Almost half (48%) of all genetics stories in Black newspapers included a personal call to action, over half (57%) had a personal or response efficacy or a screening efficacy message, compared with 6 and 9% in general audience newspapers, respectively. When we examined specific screening recommendations, genetics-related stories in Black newspapers were significantly more likely to contain screening recommendations. However, these stories with screening recommendations in Black newspapers were also more likely to be inaccurate, and stories with screening recommendations in general audience newspapers were more likely to have both accurate and inaccurate recommendations, though neither comparison was statistically significant.

Discussion

Genetics-related stories were more frequent in Black versus general audience newspapers, and this coverage in Black papers was larger, more locally and racially relevant, and more likely to contain recommendations or action steps to improve health or reduce disease risks. This finding for genetics-related stories is consistent with previous analyses of health- and cancer-related stories in these 2 types of newspapers [36, 38]. These studies suggest that Black newspapers are a community-focused media channel whose coverage reflects a leaning toward positive public health attributes [36]. Locally and personally relevant health stories as found in Black newspapers increase the likelihood that readers will actively process [44] and be persuaded by them [45, 46]. In contrast, coverage in general audience newspapers was more likely to mention genetic testing or therapy and be based on a high or moderate degree of genetic determinism.

Black newspapers were also more likely to contain terminology relating to family history, including mentioning the importance of knowing one's family history, while general audience newspapers were more likely to focus on causes of disease. This may suggest that stories in Black newspapers are doing a great job of communicating to readers the importance of knowing their family history, but less so in explaining how the cause of some diseases can (or cannot) be related to genetics. This is consistent with Kessler et al.'s [25] findings that African Americans were knowledgeable about family history, but less so about medical genetics. Another explanation is that Black newspapers in general do a better job of reporting on topics valued by African American readers. For example, the cultural characteristic of *collectivism* – the belief that the family or group, not the individual, is the basic unit of society [47] – is a widely held value among African Americans [48]. As such, perhaps it is this cultural inclination and interest toward the family that at least partly explains why Black newspapers were more likely to discuss family history in their genetics stories. Future news coverage could be improved to link family history with possible genetic causes of diseases.

The sample of Black newspapers in this study have devoted news space to genetics-related stories, have made this coverage relevant to their readership and provided cues to action for preventing disease risk. Studies have found that increased media attention to a particular health issue can lead to the public's increased knowledge of that issue [49], which have been found to lead to changes in individual health behavior [50, 51]. Thus, findings

from the current study suggest that Black newspapers may be an ideal communication channel through which findings from, and implications of, human genome research can be disseminated specifically to African American audiences. Black media such as newspapers and reporters who contribute to these media outlets may enjoy a unique influence on African Americans' understanding of and benefit from information regarding genetics and race [26]. This coverage is consistent with other studies suggesting that message development about genetics should take into account the populations' differential understanding of genes and behavior [22, 23] and their cultural and community perspectives [21].

As other studies [18] found African American respondents' reactions to genomic studies suggestive of a mistrust of science, Black newspapers have historically enjoyed a level of reach, trust and influence among African Americans not seen for general population newspapers. While not statistically significant, genetics-related stories in Black newspapers were more likely (5 vs. 1%) to mention medical mistrust compared to stories in general population newspapers.

While this study reports on a national sample of 24 Black weekly newspapers, the sample of papers was not intended to be nationally representative. The current findings may not be generalizable to other US Black newspapers or other Black media, regardless of publication frequency. Nevertheless, this study explored and characterized the potential for Black newspapers to deliver ge-

netics research findings that may influence behavior change and guide decision-making.

Next steps in this area of inquiry would involve identifying which of these characteristics and other framing efforts of genetics news stories in Black newspapers would lead to increased interest in reading a genetics news story, in gaining knowledge about genetics and behavior, and in influencing individuals' decisions and actions. Additional areas of research involve comparing other Black media such as Black television to general audience television news and examining the potential of these other media outlets. As access to health information in the US varies by race and socioeconomic status, information gaps are partly explained by failures of public health and health information systems to develop 'successfully designed systems to cater to the so-called hard-to-reach groups' [52, p. 233]. Translating important findings from genetic research for populations that can benefit from them is important for shrinking gaps in access to health information, and African American news outlets are a potentially viable media channel for delivering this information.

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References

- 1 Meissner H, Potosky A, Convisser R: How sources of health information relate to knowledge and use of cancer screening exams. *J Community Health* 1992;17:153-165.
- 2 Rakowski W, Assaf A, Lefebvre R, Lasater T, Niknian M, Carleton R: Information-seeking about health in a community sample of adults: correlates and associations with other health-related practices. *Health Educ Q* 1990;17:379-393.
- 3 Robinson J, Levy M: Interpersonal-communication and news comprehension. *Public Opin Q* 1986;50:160-175.
- 4 Viswanath K, Finnegan J: Reflections on community health campaigns: secular trends and the capacity to effect change; in Hornik R (ed): *Public Health Communication: Evidence for Behavior Change*. Mahwah, Lawrence Erlbaum Associates, 2002, pp 289-312.
- 5 Yanovitzky I: Effect of news coverage on the prevalence of drunk-driving behavior: evidence from a longitudinal study. *J Stud Alcohol* 2002;63:342-351.
- 6 Yanovitzky I, Blitz C: 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.
- 7 Brown M, Potosky A: The presidential effect: the public health response to media coverage about Ronald Reagan's colon cancer episode. *Public Opin Q* 1990;54:317-329.
- 8 Fink R, Roeser R, Venet W, Strax R, Venet L, Lacher M: Effects of news events on response to a breast cancer screening program. *Public Health Rep* 1978;93:318-327.
- 9 Hornik R: Channel effectiveness in development communication programs; in Rice R, Atkin C (eds): *Public Communication Campaigns*, ed 2. Newbury Park, Sage, 1989, pp 309-330.
- 10 Schooler C, Chaffee S, Flora J, Roser C: Health campaign channels: tradeoffs among reach, specificity, and impact. *Hum Commun Res* 1998;24:410-432.
- 11 Bonham V, Warshauer-Baker E, Collins F: Race and ethnicity in the genome era: the complexity of the constructs. *Am Psychol* 2005;60:9-15.
- 12 Condit C, Ofulue N, Sheedy K: Determinism and mass-media portrayals of genetics. *Am J Hum Genet* 1998;62:979-984.
- 13 Cappella J, Lerman C, Romantan A, Baruh L: Content analysis of public information about genetics. Centers of Excellence in Cancer Communications Research (CECCR) Meeting, National Cancer Institute, Philadelphia, April 2005.
- 14 Petersen A: Biofantasies: genetics and medicine in the print news media. *Soc Sci Med* 2001;52:1255-1268.
- 15 Racine E, Gareau I, Doucet H, Laudy D, Jobin G, Schraedley-Desmond P: Hyped biomedical science or uncritical reporting? Press coverage of genomics (1992-2001) in Quebec. *Soc Sci Med* 2006;62:1278-1290.

- 16 Mountcastle-Shah E, Tambor E, Bernhardt B, Geller G, Karaliukas R, Rodgers J, Holtzman N: Assessing mass media reporting of disease-related genetic discoveries: development of an instrument and initial findings. *Sci Commun* 2003;24:458–477.
- 17 Conrad P: Uses of expertise: sources, quotes, and voice in the reporting of genetics in the news. *Public Underst Sci* 1999;8:285–302.
- 18 Tambor E, Bernhardt B, Rodgers J, Holtzman N, Geller G: Mapping the human genome: an assessment of media coverage and public reaction. *Genet Med* 2002;4:31–36.
- 19 Cappella J, Mittermaier D, Weiner J, Humphreys L, Falcone T: Framing genetic risk in print and broadcast news: a content analysis. *CECCR Grantees Meeting: From Innovation to Dissemination* 2008. Atlanta, April 2008.
- 20 Geller G, Bernhardt B, Holtzman N: The media and public reaction to genetic research. *JAMA* 2002;287:773.
- 21 Kinney AY, Gammon A, Coxworth J, Simonson SE, Arce-Laretta M: Exploring attitudes, beliefs, and communication preferences of Latino community members regarding *BRCA1/2* mutation testing and preventive strategies. *Genet Med* 2010;12:105–115.
- 22 Condit CM, Shen L: Public understanding of risks from gene-environment interaction in common diseases: implications for public communications. *Public Health Genomics* 2011;14:115–124.
- 23 Kaphingst KA, Persky S, McCall C, Lachance C, Loewenstein J, Beall AC, Blascovich J: Testing the effects of educational strategies on comprehension of a genomic concept using virtual reality technology. *Patient Educ Couns* 2009;77:224–230.
- 24 Lachance CR, Erby LAH, Ford BM, Allen VC, Kaphingst KA: Informational content, literacy demands, and usability of websites offering health-related genetic tests directly to consumers. *Genet Med* 2010;12:304–312.
- 25 Kessler L, Collier A, Halbert CH: Knowledge about genetics among African Americans. *J Genet Couns* 2007;16:191–200.
- 26 Lynch J, Condit C: Genes and race in the news: a test of competing theories of news coverage. *Am J Health Behav* 2006;30:125–135.
- 27 Rachul C, Ouellette C, Caulfield T: Tracing the use and source of racial terminology in representations of genetic research. *Genet Med* 2011;13:314–319.
- 28 Lynch J, Parrott A, Hopkin RJ, Myers M: Media coverage of direct-to-consumer genetic testing. *J Genet Couns* 2011;20:486–494.
- 29 Wolseley R: *The Black Press*, U.S.A., ed 2. Ames, Iowa University Press, 1990.
- 30 Jones-Webb R, Baranowski S, Ran D, Finnegan J, Wagenaar A: Content analysis of coverage of alcohol control policy issues in Black-oriented and mainstream newspapers in the U.S. *J Public Health Policy* 1997;18:49–66.
- 31 Pride A, Wilson C: *A History of the Black Press*. Washington, Howard University Press, 1997.
- 32 Sylvester J: Media research bureau Black newspaper readership report; in Black F (ed): *Milestones in Black Newspaper Research*. Washington, National Newspaper Publishers Association, 1993, pp 11–13, 56–81.
- 33 Sylvester J: *Directing Health Messages toward African Americans: Attitudes toward Healthcare and the Mass Media*; thesis, University of Missouri, Columbia, 1994.
- 34 Muhammad L: *The Black press: past and present*. *Nieman Reports* 2003;57:13–16.
- 35 National Newspaper Publishers Association: *NNPA media services*. <http://www.nnpa.org/advertise-with-us> (accessed August 27, 2013).
- 36 Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D: Global cancer statistics. *CA Cancer J Clin* 2011;61:69–90.
- 37 Shuchman M: Journalists as change agents in medicine and health care. *JAMA* 2002;287:776.
- 38 Cohen EL, Caburnay CA, Luke D, Rodgers S, Cameron GT, Kreuter MW: Cancer coverage in general audience and black newspapers. *Health Commun* 2008;23:427–435.
- 39 Riffe D, Aust C, Lacy S: The effectiveness of random, consecutive day and constructed week sampling in newspaper content analysis. *Journalism Q* 1993;70:133–139.
- 40 Luke DA, Caburnay CA, Cohen EL: How much is enough? New recommendations for using constructed week sampling in newspaper content analysis of health stories. *Commun Methods Meas* 2011;5:76–91.
- 41 FileMaker Pro. Version 11.0. Santa Clara, FileMaker, Inc., 2011. <http://www.filemaker.com/products/filemaker-pro/>.
- 42 Caburnay C, Kreuter M, Luke D, Logan R, Jacobsen H, Reddy V, Vempaty A, Zayed H: The news on health behavior: media coverage of diet, activity, and tobacco in local newspapers. *Health Educ Behav* 2003;30:709–722.
- 43 Cappella JN, Mittermaier DJ, Weiner J, Humphreys L, Falcone T: Framing genetic risk in print and broadcast news: a content analysis (abstract). 93rd Annual Convention of the National Communication Association Annual Meeting, Chicago, November 2007.
- 44 Rucinski D: Community boundedness, personal relevance, and the knowledge gap. *Commun Res* 2004;31:472–495.
- 45 Petty R, Cacioppo J: The elaboration likelihood model of persuasion. *Adv Exp Soc Psych* 1986;19:123–205.
- 46 Petty R, Cacioppo J: *Attitudes and Persuasion: Classic and Contemporary Approaches*. Dubuque, WC Brown, 1981.
- 47 Kreuter MW, Lukwago SN, Bucholtz DC, Clark EM, Sanders-Thompson V: Achieving cultural appropriateness in health promotion programs: targeted and tailored approaches. *Health Educ Behav* 2003;30:133–146.
- 48 Kreuter MW, Haughton LT: Integrating culture into health information for African American women. *Am Behav Sci* 2006;49:794–811.
- 49 McCombs M, Shaw D: The evolution of agenda-setting research: 25 years in the marketplace of ideas. *J Commun* 1993;43:58–68.
- 50 Soumerai S, Ross-Degnan D, Kahn J: The effects of professional and media warnings about the associations between aspirin use in children and Reye's syndrome; in Hornik R, (ed): *Public Health Communication: Evidence for Behavior Change*. Mahwah, Lawrence Erlbaum Associates, 2002, pp 265–288.
- 51 Luepker RV, Murray DM, Jacobs DR, Mittelman MB, Bracht N, Carlaw R, Crow R, Elmer P, Finnegan J, Folsom AR, et al: Community education for cardiovascular disease prevention: risk factor changes in the Minnesota Heart Health Program. *Am J Public Health* 1994;84:1383–1393.
- 52 Viswanath K: Public communications and its role in reducing and eliminating health disparities; in Thomson G, Mitchell F, Williams M (eds): *Examining the Health Disparities Research Plan of the National Institutes of Health: Unfinished Business*. Washington, National Academies Press, 2006, pp 215–253.