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Mapping the health information landscape in a rural, culturally diverse region: Implications for understanding information inequality

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Abstract

The media is an important source of health information, especially critical in rural communities with geographically-dispersed populations that are harder to reach through other channels. Yet health information is unequally distributed; these information disparities are compounded in rural areas, which may contribute to health disparities. We identify and describe health-related news in a culturally-diverse rural California county characterized by high levels of poverty, unemployment, low educational attainment, and over half of Mexican-origin. We conducted a census of all available print news sources and then used content analysis to identify and characterize all health information printed in a 6-month study period. A total of 570 health-related articles were published. Five newspapers accounted for more than 80% of published health-related articles ($n=466$); only one targeted the majority Latino population. The most common topic was access to health care/insurance/policy (33%), followed by diet/nutrition (13%), infectious disease (10%), and general prevention (9%). Just over one-quarter of health-related articles included useful information. Differences across newspaper types existed: independent newspapers reported more on health-related events compared with chain newspapers, and both ethnic-targeted newspapers and independently-published papers were more likely to include useful information compared with chain newspapers. While this region suffers from high rates of obesity and diabetes, there were relatively few articles on obesity and diabetes themselves, or linking behavioral risk factors with these conditions. One area we found absent from coverage pertained to the numerous environmental health threats prevalent in this heavily polluted, agricultural area (just 40 articles discussed environmental health threats). We also discovered that coverage of social determinants of health was lacking (just 24 of the 570 health articles), which was notable in a region that suffers extreme economic, educational, and health disparities. This analysis of a rural region's local news coverage of health issues demonstrates significant opportunity to engage with rural local media, particularly ethnic media, to disseminate health information. Such a strategy holds considerable promise to advance public health goals using a multilevel approach: From an individual perspective, improving the amount and utility of the information can inform and educate publics in

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areas with otherwise low levels of health information access. From a policy perspective, improving coverage of the social determinants of health could shape public opinion to support policies that improve health.

Keywords

Newspapers; Mass media; Latino; Social determinants of health; Content analysis

INTRODUCTION

Researchers have observed with optimism the promise of media to contribute to the elimination of health disparities (Len-Rios, 2012; Ramirez, Graff, Nelson, et al., 2014; Viswanath, 2006), since mass media are particularly trusted sources of health information for racial and ethnic minorities that suffer from information-related health disparities (Brodie, Kjellson, Hoff, et al., 1999). For example, more than 8 in 10 (83%) of US Latinos obtain health information from the media, and 79% of those who do so act on that information (Livingston, Minushkin, & Cohn, 2008). Other studies have demonstrated significant positive effects of information-seeking from the media on health behaviors (Ramirez, Freres, Martinez, et al., 2013), improved doctor-patient communication (Rooks, Wiltshire, Elder, et al., 2012), and uncertainty management (Wiltshire, Cronin, Sarto, & Brown, 2006).

The past two decades have seen a meteoric rise in the overall amount of health information available to many individuals, particularly from mass media and other non-clinical information sources (Viswanath, Nagler, Bigman-Galimore, Jung, McCauley, & Ramanadhan, 2012). Coupled with a deliberate cultural shift toward a health care model featuring patients who are active participants in their own medical decision-making process (Kelly, Hornik, Romantan, et al., 2010), access to a rich information environment – and the ability to make sense of it – is becoming an increasingly important path to health. The mass media may constitute an especially important source for information dissemination in rural regions with geographically-dispersed populations that are harder to reach through other channels, and where local community newspapers – which tell local stories and serve an especially critical role – predominate (Garferick, 2010).

However, the unequal distribution of health information is compounded in rural regions that face multiple barriers to health, and thus may contribute to rather than reduce disparities. Access to health information is socially patterned such that low-income, less-educated, ethnic minority, and linguistic minority populations – those that characterize many rural areas – have less access to health information from a variety of sources (Lee, Ramirez, Lewis, et al., 2012; Manierre, 2015; Vanderpool, Kornfeld, Finney Rutten, & Squiers, 2009; Viswanath & Ackerson, 2011; Zhao, 2010). Rural populations also suffer disproportionately from a variety of health conditions.

Health risks specifically related to information access disparities have been documented in rural regions, including low levels of media coverage of cancer risk (Krieger, Katz, Eisenberg, Heaner, Sarge, & Jain, 2013) and opportunities for health communication

pertaining to food insecurity (Ramadurai, Sharf, & Sharkey, 2012). Given such evidence, access to health information has been considered a social determinant of health (Freimuth & Quinn, 2004), and one that may be especially important in rural settings.

This project contributed to mapping the health information environment by examining the availability of print health news in a rural, culturally and linguistically diverse region. California's Merced County is located in the geographic heart of the state, in the region known as the San Joaquin Valley (SJV), a vast, largely rural region that produces more than one-third of the country's vegetables, fruits, and nuts (Great Valley Center, 2014). Characterized by extremely high levels of poverty, unemployment, and low educational attainment, the region has been described as the "Appalachia of the West" (Cowan, 2005). Over half the county's residents are Latinos of Mexican origin, and the county is diverse in terms of language preference and nativity: 25% are foreign-born, and their primary language may be an indigenous Mexican language rather than Spanish, while 75% are native-born U.S. citizens, who possess varying levels of English proficiency (U.S. Census, 2015). Because the current demographics of the county signal the future of the country as a whole (Colby & Ortman, 2015), this project serves as a case study that may increase understanding of media access and its implications in the broader national landscape. The overarching purpose of our study was to examine the availability of published health news and their usefulness. The research was guided by the following questions:

RQ 1: What print news sources are available in the region?

RQ 2: What health related topics are covered in these sources?

RQ 3: To what extent is health information from print news sources useful?

RQ 4: To what extent do publication characteristics (publisher type and language) affect access to health information?

METHODS

To answer the first research question, we conducted a census of all English and Spanish language publications distributed in a rural central California county (1,935 square miles; population: 266,353; U.S. Census, 2015). We compiled a list of Merced County incorporated and unincorporated communities using information from the U.S. Census Bureau on major cities and census-designated places to identify all population centers in the county. We identified a total of 19 newspapers, newsletters, and bulletins that are distributed in any of the regions; of these, 14 were available to sample online or in print for the period February 1 through July 31, 2014. We were able to obtain print copies of every issue published during the study time period for 11 newspapers; 3 had full-text news items indexed online (Table 1). The others were either no longer operating or did not have archival copies to share. To answer the second through fourth research questions, we sought to identify all health-related editorial content available during the study time period in all of the publications.

Sampling

We selected the time period for sampling for two pragmatic reasons. First, the time period was contemporary to the conduct of the study so that results could inform the development

of an intervention to improve health-related news coverage. In addition, given that most of the identified publications were not indexed online, we needed to obtain hard copies for manual retrieval of health-related items.

We first defined “health” and developed a coding scheme (described more fully in the section below), and then used two approaches to identify health-related news items. For the publications indexed in the Newsbank World News database (3 of the 14), we constructed a search term (Stryker, Wray, Hornik, & Yanovitzky, 2006). To develop the search term, we began by listing the topics of central interest to the research team, based on the team’s knowledge of the geographic, social, and economic challenges facing the population in the region.¹ For the smaller community publications that were not indexed online, we collected every print issue and used the search term and codebook as guides to manually identify health-related news items. English/Spanish bilingual coders coded items retrieved through either mechanism for specific health topics (Table 2).

Codebook Development

Our multi-stage codebook development process included inductive and deductive methods to develop the codes for item topics (Konracki, Wellman, & Amundson, 2002). We began with a list of health topics from the search term. Each coder applied the skeleton codebook to 10 news items, adding categories that seemed relevant. The team then met to discuss what additions seemed relevant, and which categories were too specific and should be collapsed. This process was repeated multiple times, until we were satisfied that most health-related items would be captured in one of the major categories. Once the final codebook was developed, coders were randomly assigned calls to code. In all, nearly half (44.2%) of all items were double-coded ($n=370$). We used Stata SE 13 (Statacorp, 2014) to compute Cohen’s kappa as an assessment of interrater reliability (Neuendorf, 2002). There were 14 substantive variables of interest and nine descriptive variables. We established high levels of interrater reliability for most of the codes (mean $K=0.84$). An independent third coder who was uninvolved in the initial codebook development resolved disagreements.

Coding

Publication details—We identified various details about the publications, including the publisher, publication location, distribution range, distribution modes, and language.

News item details—Items were coded for the day and date of the week they appeared, the page number and section of the headline and first paragraph, length (number of paragraphs), whether the item was an event notice, whether there was a named reporter who wrote the story (i.e., a byline), whether the item was from a news service (0=no; 1=yes, from a local news service; 2=yes, from a sister publication owned by the same news organization; 3=yes, from an international news service such as Reuters-Thompson or the Associated Press).

¹The search term was “health OR cancer* OR diabet* OR asthma* OR hypertens* OR medicin* OR exercis* OR fitness OR ‘valley fever’ OR ‘Valley Fever’ OR diet OR nutrition OR breastfeed* OR allerg* OR obesit* OR ‘infectious disease’ OR infecti* OR diseas* NOT INCLUDING obitu* OR sewer OR colt* OR flag*”. To account for items that were in Spanish the following search terms were employed “salud OR cancer* OR diabet* OR asm* OR saludabi* OR ‘fiebre de valle’ OR ‘Fiebre de Valle’ OR dieta OR nutricion OR allergia* OR obesidad* OR enfermedad OR ‘enfermedades infecciosas’ OR amamantar”.

Health Topic—We began with 14 health topic codes relating to major diseases, body systems, and conditions, which we thought captured the major health topics likely to be covered in the area’s news publications. The health codes were: health general, preventive health, Valley Fever, nutrition and diet, infectious disease, access to health care / insurance / policy issues, cancer, cardiovascular health, air quality, climate, respiratory system (excluding Valley Fever), physical activity, and obesity (Table 2). Most codes were dichotomous (0=no; 1=yes); the “Health General” code was created to allow coders to specify health topics that we had not identified a priori. These open-ended codes were reviewed systematically after all coding was complete to identify any additional, unanticipated major codes. The following topics were identified through this post hoc analysis: diabetes, food safety, tobacco, mental health, research reports (i.e., items reporting on a scientific study), fundraising (e.g., items about a walk-a-thon to raise money in support of a disease), social determinants of health, and medical careers/training. Additionally, we combined environmental threats such as air pollution, climate, chemicals, and other related threats into a single code. The complete codebook is available upon request from the first author.

Usefulness (efficacy)—To answer the third research question, we sought to identify news items that provided information that could be used by readers to make health decisions (0=no; 1=yes). Items that were coded 1 for usefulness included information that was specific, credible, and substantial enough to facilitate a reader’s taking action upon reading. Credible information was defined as that which is substantiated by an expert source (e.g., clinicians, public health officials, researchers, industry workers/experts, people who have experienced the problem/solution the article is reporting) or statistics with an appropriate citation (Metzger, Flanagin, Eyal, Lemus, & Mccann, 2003).

Analysis

For this descriptive study, we computed frequencies and percentages of each coding category, overall and by key subgroups, which we present below. In addition to overall results, we stratified by publisher (chain vs. independent) and by language (English only vs. Spanish/Bilingual) and conducted chi-square statistical tests to determine whether differences in news coverage by newspaper type were statistically significant.

RESULTS

We initially identified a total of 838 health-related news items, then removed 191 “articles” retrieved electronically that were simply event listings with no associated news item, as well as 77 duplicate items, for a final analyzed sample of 570 health-related news items. Health stories constitute just 19.2% of all news items published in the analyzed newspapers. The average length of a health-related news story was 13.5 paragraphs (*SD*: 7.3).

Who produces the news

At the time of our study, there was no Spanish-language print news source available in this county², where 35.5% of the population speaks Spanish (U.S. Census, 2015). Further, in this majority Latino region, only one of the 14 newspapers, a bilingual weekly, specifically

targeted the Latino population; the rest were mainstream, English-language dailies (Table 1). A major chain, the McClatchy Company, published eight of the 16 papers we identified; two small regional chains published five of the papers and independent publishers published the rest. Three of the analyzed newspapers were published daily, while the rest were published one to three times per week. Most of the papers were available via home delivery or postal service as well as in select community locations (e.g., grocery stores, restaurants). The news was mostly locally produced: three-quarters of health-related news items were attributed to a specific author (i.e., had a byline), and similar proportion (76.8%) were local news stories, whereas just 15% were from a sister newspaper or a local news service, and 9% were from an international news service.

Health in the rural news

A total of 570 health-related news items were identified from among the 14 analyzed newspapers. The five largest newspapers accounted for 81.8% of the health-related news items ($n=466$; data not shown). By far, the most common health topic covered in the newspapers was related to health care access, insurance, and/or policy ($n=189$).

The next most common topics were diet/nutrition ($n=75$), infectious disease ($n=56$), general prevention ($n=51$), cancer ($n=41$), environmental health ($n=40$), physical activity ($n=31$), social determinants of health ($n=24$), and mental health ($n=22$; Table 3). Together with access, these accounted for 75.8% of the items.

Important differences across newspaper types were identified: independent newspapers reported more on health-related events than did chain newspapers ($\chi^2=217.1$, $p < .001$), and both the ethnically-targeted newspaper and independently published papers were more likely to include useful information than were mainstream and chain newspapers (respectively: $\chi^2=4.16$, $p < .05$; $\chi^2=6.93$, $p < .05$; Table 3).

Usefulness of health information in the rural news

The information provided was of limited practical utility (e.g., could not be considered health promotion). Just over one-quarter (26.5%) of the health-related items included useful information (Table 4).

DISCUSSION

We examined the health information environment in a rural, culturally and linguistically diverse California community whose demographic composition may reflect the future of the United States, and which suffers disproportionately from preventable chronic disease morbidity and mortality. We found a general paucity of health information, and also a lack of correspondence between the major health issues facing the community and the issues covered in the news. While health-related newspaper items in the rural county covered a range of topics, they mostly focused on the topics of access, insurance, and policy. Given the timeframe of the data collection (six months following implementation of the Affordable

²Since the study was completed, an independent Spanish-language newspaper has started weekly publication and serves a small community within the county.

Care Act), and ongoing regional challenges to health care access (Joint Center for Political and Economic Studies, 2012), the overwhelming focus on such issues is not unreasonable. The region faces health burdens associated with extremely high rates of obesity and diabetes, so the abundance of items relating to physical activity and diet also makes sense, although it is less clear why obesity and diabetes were not covered as topics. Our analysis also demonstrates that stories that may have logically linked behavioral determinants of obesity and diabetes – physical activity and diet – in general did not, missing an opportunity to provide useful information to readers.

Perhaps of greater significance than the topics that were covered were those that were not mentioned. Notably absent from coverage were environmental health threats such as air quality, climate change (e.g., drought and lack of access to drinking water), and fertilizer/herbicide/pesticide usage in this agricultural area. Of the 570 health-related news items, just 40 (7.0%) were about environmental health threats, despite the significant public health challenges associated with such threats in a region that consistently ranks among the top 10 most polluted in the county (American Lung Association, 2015). Also missing was coverage of the social determinants of health, notable for its absence in a region that suffers extreme economic and educational disparities that contribute to health disparities (Joint Center for Political and Economic Studies, 2012). Previous studies have documented the news media's failure to address social determinants of health as well as health disparities (Kim, Kumanyika, Shive, Igweatu, & Kim, 2010; Niederdeppe, Bigman, Gonzales, & Gollust, 2013).

Additionally, we found a surprising lack of print sources in Spanish, surprising in a region where over one-third of the population speaks Spanish. This could be due to low levels of literacy and education in this Spanish-speaking population (U.S. Census, 2015); however, that does not explain the lack of news in Spanish, since there are at least two small-scale monthly publications that were not included in this sample because they are primarily commercial advertising with some minimal editorial content but no formal news. A more plausible alternative is an unmet demand for Spanish-language news publications, which have been decreasing nationally, as have English-language publications (Pew, 2016). This is unfortunate because ethnically-targeted media – which usually means Spanish-language for Latinos – offer qualitatively different coverage than English-language or mainstream media (Matsaganis, Katz, & Ball-Rokeach, 2013; Villar & Olson, 2013).

We also found a lack of specifically local content, such as that focusing on local health challenges and providing information about local resources. Finally, our study demonstrated that news coverage of health issues in a rural community lacked information that would help make the news useful as a vehicle for health promotion information, suggesting that despite the promise of newspapers to serve as health communication channels, there is much opportunity to grow to realize that promise. Both of these patterns are consistent with previous content analyses of California newspapers in general (Wang & Rodgers, 2013) as well as Latino-targeted newspapers in particular (Vargas & dePyssler, 1999).

The construct of “usefulness” as employed in this study warrants additional consideration and future research that could improve its utility for communication interventions. There is

substantial evidence about what makes news credible, including source, structure, and audience features (Metzger et al., 2003), as well as evidence from communication interventions about strategies to increase credibility and enhance relevance (Cohen et al., 2010; Ramírez, 2013). In addition, literature from the audience perspective (e.g., information seeking) provides evidence that individuals find utility in health information from the news and use it to make decisions about their health (cf., Ramírez et al., 2013). Missing from the literature, however, is evidence about what constitutes usefulness. If relevance is important to gain the audience's attention to the information and credibility is importance to enhance trust, what is it that makes information useful? Certainly the answer will vary depending on the specific topic, but a set of evidence-based guidelines would provide a useful framework for interventions to increase health information in the news media.

Limitations

We recognize that this study has a few limitations. First, we acknowledge that newspaper coverage is only part of the mass media landscape. Future analyses should consider radio and television news as well as advertising on mass media and in outdoor channels such as billboards and bus shelters for a more comprehensive picture of the health information landscape. A second limitation is methodological: we are missing a few newspapers whose February–July 2014 issues were not available in either print or online format. Since these are not missing at random but rather constitute systematic exclusions of the newspapers, we cannot claim to have painted a complete picture of the print information environment in the region. Nonetheless, we are confident that the general pattern of results we found is accurate, since the publications we excluded are small and have even fewer resources to include health content than the papers that we were able to include. We also conducted some *post hoc* content analyses of current issues of the media we examined (by collecting them in real-time), and are confident that the inclusion of these would not have substantially altered our results (data not shown). A unique strength of our study is our in-depth examination of all print news sources within a limited geographic area that corresponds to the public health governance structure.

Implications for practice

Given decades of evidence that mass media can be important sources for health information that can change social norms and health behaviors, we see a substantial opportunity for the news media in rural communities to improve the quality and quantity of health information and thereby serve as an important health promotion tool. An intervention to achieve the goal of disseminating useful and relevant health information should involve partnerships with mass media organizations, researchers, and public health officials. Providing health information subsidies could help news organizations to fulfill their public service function specifically by reducing the high costs of producing news that keep mainstream news organizations at the mercy of advertisers (Pew, 2016). For researchers and public health officials, engaging with media may mean partnering to provide background information for reporters and offering to provide localized and ethnically relevant statistics and content. In addition, public health officials, along with locally based university researchers, should be more accessible for commenting on public issues that face communities, and public health

officials can provide access to resources for audiences. This is an approach that has demonstrated success in an urban area specifically as a means to increase the quantity, quality, and cultural relevance of cancer information in African-American targeted newspapers (Caburnay, Luke, Cameron, Cohen, Fu, et al., 2012). One recent test with a broader health agenda found that providing localized and demographically-targeted health news items to local news outlets was an effective strategy to increase the amount of health information in the news (Young, Willis, Stemmie, & Rodgers, 2015). The effects were particularly strong for rural areas. This may be because of increased demands on journalists' limited time, resources, knowledge, and motivations (Friedman, Tanner, & Rose, 2014; Hubbell & Dearing, 2003; Nothwehr, Chrisman, & Andsager, 2014; Wallington, Blake, Taylor-Clark, & Viswanath, 2010).

Ethnic media in particular have been noted as potentially valuable partners to expand the reach and effectiveness of health information that may reduce health disparities (Cohen, Caburnay, Len-Rios, et al., 2010). In our study, which included one ethnic newspaper, we found some evidence that ethnic newspapers may cover different information than their mainstream counterparts, information that may be more relevant for that specific ethnic population. For example, the ethnic newspaper in our study was more likely to cover access issues and to include useful information in the news stories. Other studies have found similar patterns; for example, Kalin and Fung's (2013) comparison of Spanish- and English-language parenting magazines demonstrated that Spanish-language magazines present nutrition and child obesity issues in a culturally sensitive manner that can help to change health beliefs. Another content analysis of magazines found that one targeting Latinas was more likely to cover diabetes and obesity, and presented information in a culturally appropriate manner (Len-Ríos & Hinant, 2014). Thus, engaging with ethnic rural media has considerable promise to advance public health goals, and our analysis of one region's news coverage of health issues demonstrates opportunity for such a strategy.

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Table 1

Characteristics of sampled newspapers.

NEWSPAPER	PUBLISHER	LANGUAGE	FREQUENCY	CIRCULATION	DISTRIBUTED
Merced Sun-Star	McClatchy Company	English	Daily	14,219 Daily 18,569 Sat	Mailed Machines Stores
Merced County Times	Mid-Valley Publications	English	Weekly	5,600	Free drops Local businesses Machines Mailed
Atwater-Winton Times	Mid-Valley Publications	English	Weekly	4,400	Mailed Machines Local businesses
Hilmar Times	Mid-Valley Publications	English	Weekly	5,000	Mailed Machines Local Businesses
Atwater Signal ^a	McClatchy Company	English	Weekly	13,000	Inside Merced Sun-Star
Chowchilla News	McClatchy Company	English	Weekly	2,500	Home delivery
Livingston Chronicle ^a	McClatchy Company	English	Weekly	13,000	Home delivery
Los Banos Enterprise	McClatchy Company	English	Weekly	3,499	Home delivery
West Side Index	Martos Newspapers Inc.	English	Twice per week	7,500	Mailed
Gustine Press Standard	Martos Newspapers Inc.	English	Twice per week	7,500	Mailed
Turlock Journal	Morris Multimedia, Inc.	English	Three times per week	18,500	Racks Mailed Main office
Dos Palos Sun	Dos Palos Publishing Co.	English	Weekly	1,300	Mailed Stores Supermarkets Machines
Fresno Bee	McClatchy Company	English	Daily	157,546 Daily 180,043 Sunday	Stores Machines Mailed

NEWSPAPER	PUBLISHER	LANGUAGE	FREQUENCY	CIRCULATION	DISTRIBUTED
Modesto Bee	McClatchy Company	English	Daily	60,595 Daily 72,680 Sunday	Mailed Stores Machines
Vida en el Valle-Merced	McClatchy Company	Bilingual (English & Spanish)	Weekly	15,909	Home delivery

^aNewspaper is distributed free of charge

Table 2

Health Topic Codes With Sample Headlines.

Health Topic	%	n	Illustrative Headlines (Newspaper, Page, Date)
Health General	34.7	198	• "Childhood hunger battle seeks volunteers" (<i>Modesto Bee</i> , 1B, 4/25/14)
			• "E-cigarette manufacturers shouldn't market to children" (<i>Fresno Bee</i> , A10, 2/28/14)
			• "At 90, doctor is still calling on women who need help" (<i>MercedSun-Star</i> , B2, 2/8/14)
Access/Insurance Policy	33.2	189	• "New deadline looms for Valley Medi-Cal – Rush is to sign up by April 15" (<i>Fresno Bee</i> , A3, 5/3/14)
			• "Newman closely monitoring water issues" (<i>Gustine Press Standard</i> , A2, 5/8/14)
			• "Covered California opens a special enrollment period" (<i>Merced Sun-Star</i> , 5, 6/5/14)
Nutrition & Diet	13.2	75	• "Almuerzos gratis durante el verano" [Free summer lunches] (<i>Vida en el Valle</i> , A8, 5/21/14)
			• "Legislature should put warning on sugary soda" (<i>Fresno Bee</i> , A9, 5/12/14)
			• "Food industry seeks voluntary GMO labeling" (<i>Turlock Journal</i> , A5, 2/7/14)
Infectious Disease	9.8	56	• "West Nile virus detected in Stanislaus County" (<i>Westside Index</i> , A2, 6/26/14)
			• "Whooping cough rates climb in the state, locally" (<i>Turlock Journal</i> , A1, 6/20/14)
			• "51 more salmonella cases tied to Foster Farms chicken plants" (<i>Arwater Signal</i> , 5, 3/15/14)
Preventive Health	9.0	51	• "Stay hydrated when working out in heat" (<i>Turlock Journal</i> , 2, 6/21/14)
			• "West Nile season approaching" (<i>Turlock Journal</i> , A3, 05/31/14)
			• "Seven steps toward a healthier heart" (<i>Turlock Journal</i> , B8, 02/26/14)
Cancer	7.2	41	• "Hilmar teen sparks rally to help girl" (<i>Merced Sun-Star</i> , 3, 6/10/14)
			• "Baseball must snuff out the use of tobacco" (<i>Merced Sun-Star</i> , 7, 6/21/14)
			• "Woman beats cancer survival odds; Salidan among 6% of those to see 5th year after pancreatic surgery" (<i>Modesto Bee</i> , 2, 3/31/14)
Physical Activity	5.5	31	• "Assets boosts studies, exercise" (<i>Merced Sun-Star</i> , A1, 2/3/14)
			• "A place where everyone can dance" (<i>Livingston Chronicle</i> , 7, 5/24/14)
			• "Join in and celebrate 'Bike To Work'" (<i>Merced County Times</i> , 3, 05/15/14)
Cardiovascular System	2.8	16	• "App notifies users of cardiac arrest, aids with CPR" (<i>Livingston Chronicle</i> , 1, 2/08/14)
			• "Seven steps towards a healthier heart" (<i>Turlock Journal</i> , B8, 2/26/14)

Health Topic	%	n	Illustrative Headlines (Newspaper, Page, Date)
			<ul style="list-style-type: none"> • “Chronic disease program received countywide support” (<i>Hillmar Times</i>, 1, 2/27/14)
Air Quality ^a	2.6	15	<ul style="list-style-type: none"> • “New path to better Fresno health” (<i>Fresno Bee</i>, A13, 5/9/14) • “Health researcher named to San Joaquin Valley air board” (<i>Merced Sun-Star</i>, B2, 2/7/14) • “Valleys air better but still bad” (<i>Livingston Chronicle</i>, 1, 5/10/14)
Climate ^a	2.5	14	<ul style="list-style-type: none"> • “Drought may raise prices for groceries” (<i>Merced Sun-Star</i>, A1, 3/12/14) • “Climate change real and damaging” (<i>Los Banos Enterprise</i>, A7, 4/4/14) • “Area’s dry conditions increasing allergy symptoms in sufferers” (<i>Arwater Signal</i>, 1, 6/21/14)
Obesity	2.5	14	<ul style="list-style-type: none"> • “As a nation, we’re still way too fat” (<i>Merced Sun-Star</i>, 7, 3/1/14) • “Stamiasaus combats obesity; county pledges to promote physical activity, nutrition” (<i>Modesto Bee</i>, 1A, 3/5/14) • “Valley diabetes rates skyrocket – More than a third of patients in area hospitals have the condition” (<i>Fresno Bee</i>, A1, 5/15/14)
Respiratory System (excludes Valley Fever)	2.1	12	<ul style="list-style-type: none"> • “Tuberculosis cases vary in Valley areas” (<i>Merced Sun-Star</i>, 4, 3/26/14) • “Drought kicks up allergies” (<i>Merced Sun-Star</i>, 4, 4/23/14) • “Passive smoke affects the long term health of kids” (<i>Turlock Journal</i>, 7, 5/17/15)
Valley Fever	1.4	8	<ul style="list-style-type: none"> • “Valley Fever victims studied” (<i>Merced Sun-Star</i>, A1, 5/1/14) • “Focus is on Valley Fever and children” (<i>Merced Sun-Star</i>, A1, 4/1/14) • “New test detects Valley Fever quicker – medical research conducted in Fresno spawns test” (<i>Fresno Bee</i>, A1, 3/23/14) • “Study: Valley Fever killed 3 prison workers” (<i>Turlock Journal</i>, A5, 2/7/14)
Usefulness	26.5	127	<ul style="list-style-type: none"> • “Gluten...should you or shouldn't you?” (<i>Hillmar Times</i>, 2, 2/27/14) • “Stay hydrated when working out in heat” (<i>Turlock Journal</i>, 2, 6/21/14) • “Seven steps towards a healthier heart” (<i>Turlock Journal</i>, B8, 2/26/14)
Post-hoc health topics derived from analyses of the “Health General” topic code			
Social Determinants	4.2	24	<ul style="list-style-type: none"> • “Get kids off on the right foot” (<i>Modesto Bee</i>, 1B, 3/7/14) • “Valley counties remain unhealthy” (<i>Fresno Bee</i>, A4, 3/24/14) • “Mobile clinic aimed at veterans” (<i>Los Banos Enterprise</i>, A1, 4/11/14)
Mental Health	3.9	22	<ul style="list-style-type: none"> • “Indocumentados no acuden a servicios médicos como los ciudadanos estadounidenses” [Undocumented don’t seek medical services like US citizens] (<i>Vida en el Valle</i>, A1, 5/21/14) • “Bienestar de latinos inicia diálogo sobre salud mental” [Well-being of Latinos initiates dialogue on mental health] (<i>Vida en el Valle</i>, C1, 5/23/14)

Health Topic	%	n	Illustrative Headlines (Newspaper, Page, Date)
Tobacco	2.6	15	<ul style="list-style-type: none"> • “The healing power of animal therapy” (<i>Merced Sun-Star</i>, A5, 5/13/14) • “Baseball must snuff out the use of tobacco” (<i>Merced Sun-Star</i>, A11, 6/21/14) • “New survey shows Merced County tenants want protection from secondhand smoke” (<i>Merced County Times</i>, 2, 6/19/14) • “The debate on e-cigarettes: What part of no danger don’t you understand?” (<i>Turlock Journal</i>, A4, 6/14/14)
Career	3.0	17	<ul style="list-style-type: none"> • “Career conference in health is for youths” (<i>Merced Sun-Star</i>, A2, 3/25/14) • “Mannequins help train hospital staff” (<i>Merced Sun-Star</i>, A1, 07/08/14) • “Fresno ranks high in health care jobs – but report says most jobs are low-wage, low-skill” (<i>Fresno Bee</i>, A1, 7/24/14)
Chemicals/Environmental Hazards ²	2.3	13	<ul style="list-style-type: none"> • “EPA proposes pesticide rules to safeguard farmworkers” (<i>Merced Sun-Star</i>, A4, 2/21/14) • “Warm spring breeds West Nile concerns” (<i>Westside Index</i>, A1, 5/29/14) • “What antibiotics may be doing to us” (<i>Turlock Journal</i>, A5, 7/16/14)
Diabetes	1.6	9	<ul style="list-style-type: none"> • “Valley diabetes rates skyrocket – More than a third of patients in area hospitals have the condition” (<i>Fresno Bee</i>, A1, 5/15/14) • “Complications due to diabetes declining” (<i>Merced Sun-Star</i>, A1, 4/23/14) • “Diabetes and sugary soda” (<i>Fresno Bee</i>, A9, 5/20/14)
Fundraising	1.4	8	<ul style="list-style-type: none"> • “Kisses help hearts” (<i>Modesto Bee</i>, 1B, 2/12/14) • “Community challenge to collect food money for local kids” (<i>Turlock Journal</i>, A3, 3/5/14) • “Radiothon to support children’s hospital” (<i>Atwater-Winton Times</i>, 9, 6/26/14)
Food Safety	1.2	7	<ul style="list-style-type: none"> • “Food industry seeks voluntary GMO labeling” (<i>Turlock Journal</i>, 1, 2/1/14) • “History reminds us of perils of drinking untreated milk” (<i>Merced Sun-Star</i>, A5, 4/22/14) • “Fresno company Helados La Tapatia pulls ice cream” (<i>Merced Sun-Star</i>, A2, 3/21/14)

Note. N=570. Excludes items that do not explicitly mention health concerns/benefits. Codes are not mutually exclusive and an item may have been coded with two or more codes.

²The following codes were merged post hoc and presented together as “environmental influences on health” in the tables that follow: air quality, climate change, and chemicals/environmental hazards.

Table 3

Top nine and all other topics, overall and by publisher and language

Topic	Full Sample			McClatchy News			Mid Valley Publications			Independent			English Only			English/Spanish Bilingual		
	%	n	n	%	n	n	%	n	n	%	n	n	%	n	n	%	n	
Event	38.5	293	11.6	48	44.9	22	14.9	15	30.9	162	Access	58.7	27					
Access to Care / Insurance / Policy	33.2	189	37.4	155	18.4	9	23.4	25	13.0	68	Nutrition	15.2	7					
Nutrition/Diet	13.2	75	11.4	47	10.2	5	21.5	23	10.3	54	Infectious Disease	13.0	6					
Infectious Disease	9.8	56	10.4	43	10.2	5	12.2	13	8.6	45	Preventive Health	10.9	5					
Preventive Health	9.0	51	8.5	35	8.2	4	11.2	12	7.6	40	Cancer	8.7	4					
Cancer	7.2	41	7.5	31	8.2	4	8.41	9	7.4	39	Environmental Health							
Environmental Health [†]	7.0	40	7.3	30	8.2	4	6.5	7	5.7	30	Physical Activity							
Physical Activity	5.5	31	4.8	20	6.1	3	6.5	7	4.4	23	Social Determinants							
Social Determinants	4.2	24	3.9	16			3.7	4	3.4	18	Mental Health							
Mental Health	3.9	22	3.9	16							All other	1.4	8					
All other	24.2	138	16.5	94	3.5	20	4.7	27	22.6	129	All other							

Note. Health topics are not mutually exclusive and any call may have had multiple codes assigned. The percentages shown here do not sum to 100%, and were computed as follows: The numerator for each topic is the total number of unique news stories that was coded with that topic, and the denominator is the total number of items for each sample, excluding duplicates and events-only.

[†] Environmental health includes items coded as pertaining to air quality, climate change, and chemicals or other hazardous exposures.

Table 4

Event and Usefulness

	Full Sample	McClatchy News	Mid Valley Publications	Independent	English Only	English/Spanish Bilingual
	N=570	n=414	n=49	n=107	n=524	n=46
	%	%	%	%	%	%
Event	38.5	11.6	44.9	14.9	15.5	8.7
Usefulness ^a	26.5	25.2	16.2	37.0	25.2	39.1
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>
	293	48	22	15	81	4
	127	91	6	30	109	18

^aDenominator (full sample size) is 477 because we were missing two issues.