
How People Obtain Their Health Information—A Survey In Two Pennsylvania Counties

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Synopsis

A sample of 182 respondents to a mail survey in two Pennsylvania counties, one rural, one urban, provided information on the sources of their health information. Research questions addressed were from what sources did they obtain their health information, what differences were there in patterns of response between middle-aged and older residents, and how much did various subgroups use health information.

Respondents indicated they received most of their health information from printed materials, television, and informal network members, in that order, with little difference between rural and urban respondents. Radio and organizations, such as unions, were less frequently used as health information sources. The amount of information received from printed materials decreased slightly with age for women, but decreased sharply for men. The amount of information received from TV decreased with age, especially for urban residents. The youngest and oldest groups reported receiving the most health information from printed materials. TV was the most common source of health information for middle-aged adults.

The findings indicate that persons disseminating health information should target their efforts through printed materials, TV, and informal networks. The most frequently mentioned sources of health information were TV specials, news stories, magazines, news articles, publications, medical books, and physicians. Radio and organizations, used by large segments of the population, are relatively untapped in terms of their potential, and not fully used when available. The urban elderly appear to receive little health information from any source.

HEALTH INFORMATION is a major component of the process of health promotion (1). As described by Breslow, "further gains in health during the remainder of the century depend largely upon the systematic use of available knowledge and development, testing, and application of further knowledge likely to benefit health" (2). As strategies for health care and promotion shift from remedial to preventive, health professionals are increasingly emphasizing the role of the individual in assuming personal responsibility for health and for obtaining adequate information necessary to make informed health choices (3).

As discussed by Becker and Maiman, the health information role is directly linked to health outcomes (4). In an attempt to integrate existing models of health behavior, six distinct components can be derived from the major models (4). These include the perception of illness and the threat of disease, knowledge of disease, social network vari-

ables, demographic variables, access to health care, and attitudes toward health care.

Health information affects and is affected by each of these components. For example, individuals who are aware of the health benefits of exercise and a low fat, high fiber diet may be more willing to comply with a prescribed health regimen requiring a change in lifestyle. Also, social network members may serve as information and referral agents, directing individuals to health care professionals and recommending alternatives to formal care.

Variables relevant to health information which have been included in existing models of health behavior include general knowledge about disease and health, factual information about specific health conditions, topics on which health information is sought, and sources of health information. We examined the roles of sources of health information, including television, radio, magazines,

health-care providers, and informal network members.

Access to health information is thought to be related to access to health care, and both are thought to be distributed inequitably. For example, those persons who are less well educated, less affluent, and who receive less health information incur the highest health risks. These predisposing factors have been linked particularly to older rural populations.

We studied differences in sources of health information between rural and urban residents, older and younger respondents, and men and women. Knowledge of the sources from which individuals receive health information, and patterns of differential use, will help in targeting and marketing health information, especially with potentially at-risk groups.

Methodology

Sample. The study population included adults 30 years and older residing in two Pennsylvania counties. Philadelphia County is large (1.7 million persons in 1980), metropolitan, and classified as 100 percent urban (5). Forest County is rural, with 5,000 persons in 1980, no center with 2,500 or more persons, and is not adjacent to any metropolitan area. Forest County is classified as zero percent urban (5).

Respondents were selected in Philadelphia County by random dialing and in Forest County by systematic random sampling from telephone directories. Quotas insured equal numbers of men and women and equivalent distribution of participants in three age groups (30 to 44, 45 to 64, and 65 and older). This strategy facilitated sex and age comparisons of the study population according to the sources from which people receive health information.

Data collection procedures. Data were collected as part of a study entitled "Adoption of and Adherence to Preventive Health Behaviors Among Rural Pennsylvania Adults" (information about the project is available from the authors). The two phases of data collection included a structured telephone interview and a followup mail questionnaire. Both components of data collection were completed between June and September 1984. The data were collected using a mail questionnaire. Only those of the total sample of 300 respondents (150 from each county) who completed the telephone interview and the mail followup were

included in the analysis. This subgroup represents 182 respondents.

The two-stage data collection strategy imposes a source of bias which may limit generalizations of the data. First, after completion of the telephone interview, respondents who also returned the mail questionnaire may differ systematically from those who completed only the telephone interview. Thirteen percent (N = 39) refused to provide their name and address, and no mail questionnaire could be forwarded.

In this study, respondents who participated in the telephone interview and the mail questionnaire were more likely to be younger, and white, and were six times more likely to reside in the rural area than those who completed only the telephone interview. The data are based on a subsample which is not totally generalizable to the stratified random group. The reported analyses and conclusions drawn should be viewed as suggestive because of the sources of bias mentioned and the small sample size.

The demographic characteristics of the 182 respondents included in the telephone and mail questionnaire sample are summarized in table 1. The mean age of those in the sample was 55 (SD = 15), and the range was 30 to 90 years of age. The mean number of years of education was 12 years, or graduation from high school (SD = 3), and the range was 4 to 20 years. Slightly more women than men were included in the study (56 percent to 44 percent). More participants resided in the rural than the urban county (63 percent to 37 percent). The majority of respondents were married (65 percent) and white (91 percent).

The instrument used to assess the source from which individuals receive health information was designed for the baseline phase of the Pennsylvania "Community Health Improvement Program." Participants were asked to indicate on a four-point scale how much information they received from the following sources: television (including news stories, public service announcements, talk shows, advertising, and special programs), radio (including news stories, public service announcements, talk shows, and advertising), printed materials (including health articles in magazines, materials from health organizations, such as the American Heart Association, and medical books and encyclopedias), informal members of networks (including physicians and clinics, nurses, pharmacists, family members, and friends), and organizations (including unions, employers, shopping centers, and other organizations).

Response categories for the self-rated scale were (a) "you get no information at all," (b) "you get only a little information," (c) "you get some information," and (d) "you get a great deal of information." A fifth category, "doesn't apply to me," was also offered if, for example, respondents did not read a newspaper or belong to a union. Five items each were included in the television, printed materials, and network member sources. For radio and organizations, four items were included in each source category. Average scores were created for each of the five source categories by summing scores for the items within each source category and dividing by the number of items. Thus, the range of possible scores for television, printed materials, and network members was 1 to 5. For radio and organizations, the range of possible scores was 1 to 4. Items for each category demonstrated high inter-item and item-total correlations. Higher scores for each category indicated the subject receiving more information from a particular source.

The three research questions were from what sources do adults receive health information; what differences in patterns of response exist between middle-aged and older respondents, males and females, and rural and urban residents; and which source provides the most health information for various subgroups of the sample?

To address the questions, descriptive statistics and analyses of variance were employed. Sources of health information were the dependent variables in the analyses.

Results

As indicated by average scores, respondents received the most health information from printed materials ($\bar{X} = 3.6$), followed by television ($\bar{X} = 3.5$), and the informal network ($\bar{X} = 3.4$). Radio ($\bar{X} = 2.8$) and organizations ($\bar{X} = 2.1$) were less frequently mentioned as sources of health information.

Response patterns for the variables comprising each of the five average scores are depicted in table 2. (Note that percentages do not total 100 in each row because of missing data.) Respondents were most likely to report receiving a great deal of information from physicians or clinics, television specials, magazine articles, medical books, and publications, in order of frequency. The categories from which respondents were most likely to report receiving no information include radio talk shows, television talk shows, radio announcements,

Table 1. Demographic characteristics of 182 respondents in a survey to determine their sources of health information

Characteristic	Number	Percent
Sex:		
Male	80	44
Female	102	56
County:		
Rural	114	63
Urban	68	37
Employment status:		
Working	70	39
Unemployed	8	4
Retired	57	31
Keeping house	37	20
Other	10	6
Marital status:		
Married	119	65
Single	63	35
Family income:		
Less than \$10,000	26	14
\$10,000-\$19,999	69	38
More than \$20,000	67	37
Missing	20	11
Ethnic status:		
White	166	91
Black	14	8
Other	2	1

nurses, pharmacists, unions, employers, shopping places, and organizations.

In the next stage, we analyzed group differences in the frequency with which respondents received health information from each of the five sources. Analyses of variance were conducted, in which type of residence (rural or urban county), age, and sex were the independent or group factors. In this analysis technique, a determination was made of whether significant differences existed among the means defined by the independent variables. The average scores represent the frequency of receiving health information from each source. Table 3 shows a significant county-by-age interaction for four of the five source categories except radio.

The county-by-age interaction for health information received from television indicates that for the youngest age group, 30 to 44 years, there was virtually no difference between the counties ($\bar{X} = 3.4$ for urban and $\bar{X} = 3.5$ for rural). For the 45 to 64 group, however, scores remained high for urban residents ($\bar{X} = 3.5$), but declined for the rural residents ($\bar{X} = 2.8$). The scores for health information received from television for the 65 and older group declined for the urban residents ($\bar{X} = 2.7$) but remained stable for the rural residents ($\bar{X} = 2.8$). To summarize, health information scores for television were generally high, but declined with age, especially for urban residents.

Table 2. Percent distribution of responses of 182 subjects surveyed to determine their sources of health information, by source subgroup and amount of information received from the subgroup

Source	None	Little	Some	Great deal	Does not apply
Television:					
News stories	7	18	45	18	5
Announcements	13	30	34	5	5
Talk shows	17	24	29	11	7
Advertising	10	30	36	8	3
Specials	6	18	31	29	6
Radio:					
News	14	30	22	9	16
Announcements	17	34	20	4	12
Talk shows	24	25	19	5	15
Advertising	19	32	21	6	12
Printed material:					
Magazine articles	6	12	29	28	8
Newspaper columns	6	14	43	19	8
Newspaper news	7	20	41	14	7
Publications	10	22	30	21	8
Medical books	10	20	20	28	11
Informal network:					
Physicians and clinics	2	12	31	49	5
Nurses	18	19	31	10	8
Pharmacists	17	23	31	9	6
Family	8	34	34	5	5
Friends	11	37	31	3	4
Organizations:					
Union	17	7	7	2	56
Employer	45	13	4	5	40
Shopping places	34	35	7	3	10
Organizations	28	29	13	8	15

NOTE: Rows may not add to 100 because of missing data.

A significant county-by-age interaction is demonstrated for the frequency with which respondents received health information from printed materials, the informal network, and organizations (table 3). The pattern of response was almost identical to that for the county-by-age interaction for television. That is, scores for each county remained high and nearly equivalent for the youngest age group (30 to 44). However, for the 45- to 64-year-group, scores increased for the urban but decreased for the rural residents. The trend is reversed for the older group; scores for urban residents declined sharply while scores increased for rural residents. For rural residents, the youngest and oldest age groups were higher.

A significant age-by-sex interaction was discovered for printed materials. For women, scores decreased only slightly with age ($\bar{X} = 3.7$ for the youngest group and $\bar{X} = 3.4$ for the oldest group). For men, however, scores dropped sharply with age (from $\bar{X} = 3.4$ for the youngest group to $\bar{X} = 2.1$ for the oldest group).

Analyses were conducted to test the research question of which sources provided the most information for subgroups. Age, sex, and county

differences for the main sources of information that respondents relied upon are described in table 4. Mean summary scores are shown for each source, as well as a rank order within each demographic category (displayed by column, not row). While the analysis described in the previous section focused on between-group differences, within-group differences were examined to determine from which source rural residents received the most health information. Similar questions could be asked for women or respondents aged 65 and older.

The youngest and oldest age groups reported receiving the most health information from printed materials. For the middle-aged group, television was the most commonly mentioned source of health information. The least frequently mentioned sources for all age groups were radio and organizations.

No differences between counties in sources of health information were discovered. Printed materials, followed by television and informal networks, were the most frequently mentioned sources for rural and urban residents. Overall, women received more health information from all sources

Table 3. Analysis of variance F results showing the effects of county of residence, age, and sex on reported scores of use of health information sources in survey of 182 subjects

Source	TV	Radio	Printed materials	Informal network	Organizations
County	0.13	0.73	0.45	0.07	1.13
Age	¹ 8.33	² 6.54	² 6.33	² 6.70	¹ 9.24
Sex	7.51	0.13	¹ 14.18	³ 4.27	0.00
County x age	² 4.39	2.61	³ 6.75	² 5.57	³ 3.48
Age x sex	1.56	0.51	³ 4.08	0.53	1.35
County x sex	1.50	0.42	2.40	1.75	1.02

¹P < .001 ²P < .01 ³P < .05 NOTE: Degrees of freedom: 2,161.

than did men. Printed materials were the most frequently mentioned sources of health information for women, followed by television and network members. For men, no single source of health information was predominant. Network members, printed materials, and television each were frequently mentioned by all respondents.

Overall, few differences were discovered in the rank order of the sources from which respondents received most of their health information. However, similarity was seen in responses of the youngest and oldest groups. Printed materials were the most important source of health information for participants 30 to 44 years and those 65 and older. Television was the most important source for the middle-aged group.

Summary of Results

The majority of rural and urban adults reported printed materials to be the most frequently used source of health information. Printed materials include health articles in magazines, medical columns in newspapers, and news stories in newspapers, publications from health organizations, and medical books and encyclopedias. The second most frequently mentioned source was television, including news stories, public service announcements, talk shows, and advertising and special programs. Informal networks were the third most frequently mentioned source, including physicians and clinics, nurses, pharmacists, family members, and friends. Receiving health information from radio and organizations was less frequently reported.

Trends emerged when age, sex, and county differences in response patterns were examined. Patterns of response differed for rural and urban residents. The amount of health information from all sources that respondents in the urban county reported receiving decreased with age. For rural residents, however, a different trend emerged. For four of the five health information categories,

scores were highest for rural residents in the youngest age group, dropped sharply for the 45 to 64 group, and rose again for the oldest group. The rural county residents, especially the older women, received a great deal of health information from a variety of sources. Overall, women reported receiving more health information from all sources than did men. Additionally, women received only slightly less health information with increasing age, and older men received far less than younger men.

Discussion and Implications

The finding that printed materials, television, and the informal network were the sources which provided rural and urban respondents with the most health information suggests that persons who disseminate health information should continue to target their efforts through these outlets. Specifically, television specials and news stories, magazine and newspaper articles, publications, medical books, and physicians are the most frequently mentioned sources of health information. Alternatively, few respondents reported receiving any health information from radio or organizations. Two potential implications can be drawn: first, radio and organizations, although used by a large segment of the population, are relatively untapped in terms of their potential for the distribution of health information; and secondly, health information which is disseminated by radio and organizations is not widely used even when it is available.

These findings suggest that the urban elderly may be considered a potentially "at-risk" group for the receipt of health information. Compared to their rural counterparts and other urban residents younger than 65, this group received very little health information from any source. Although additional analyses of these data will be necessary to determine descriptive characteristics to help explain this finding (that is, socioeconomic status and educational level), it seems appropriate to

Table 4. Sources of health information reported by 182 subjects, with mean scores and rank order of sources, by subject age, sex, and county of residence

Sources	30-44 years		45-64 years		65 and older		Men		Women		Rural county		Urban county	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Printed materials	3.6	1	2.8	3	3.2	1	2.9	2	3.6	1	3.2	1	3.2	1
TV	3.5	2	3.2	1	2.6	3	2.9	3	3.3	2	3.1	2	3.0	3
Informal network	3.4	3	3.1	2	2.8	2	3.0	1	3.2	3	3.1	3	3.1	2
Radio	2.9	4	2.5	4	2.2	4	2.5	4	2.6	4	2.5	4	2.0	4
Organizations	2.3	5	1.9	5	1.8	5	2.0	5	2.0	5	1.9	5	2.0	5

encourage health professionals to make special efforts to reach this group. Future research conducted with a larger sample is needed before definitive conclusions can be made about why older people residing in urban areas appear not to be receiving much health information.

Men are an additional "at-risk" group for the receipt of health information, especially those older than 65. Contributing to this lack of information may be the tendency for women to serve as caregivers for their spouse, including the role of lay health care provider. Special efforts to increase the availability and acceptability of health information to men may include an emphasis on health issues unique to or more common among men, information delivery by men, and emphasis on short-term advantages to improving one's health (including increased stamina, strength, appetite, and overall level of functioning).

Additional research is needed to determine the type or level of information received from each source. Examples of appropriate health information may be a listing of warning signs for cancer, a personalized diet to reduce high blood pressure, a public service announcement for a local health screening, or even a friend's home remedy for nicotine withdrawal. Obviously, some types of health information are more appropriately delivered by some sources than others. For example, a physician is most likely to provide a patient with a diagnosis of health conditions, but television may best educate the public about new health care strategies related to specialized surgical techniques, as for example, coronary bypass surgery. Additionally, it would be useful to determine how satisfied individuals are with the health information they receive, and whether they are willing and able to incorporate that information into their personal health regimens.

Since television is so widely used as a source of health information, more specific information about access to and types of television coverage is warranted. Some relevant questions for future

research are how many TV stations are you able to receive; is pay-TV cable service available; if so, do you subscribe; how many hours of TV do you watch each day; and do you watch TV more frequently during the morning, afternoon, early evening, or late evening? Answers to these types of questions would provide valuable information for targeting health information to particular TV audiences during peak viewing hours and for using different types of formatting, such as the evening news, public or cable programs, and news briefs.

Most health information can be disseminated by a combination of press and broadcast media (television, radio, brochures, and health fairs, for example), and various sources of health information should not be considered independent or mutually exclusive. Unfortunately, the sole reliance on quantitative summary scores sometimes hides these distinctions. Comparative studies of the impact of disseminating health information from different sources is warranted.

Research suggests that people who have access to health information do not always choose to use it. A striking example is the limited impact of the public campaign to warn cigarette smokers of their health risks. However, our health consciousness is clearly pervasive, as evidenced by its prominence in the media and in the growth of fitness, exercise, and nutrition-related industries. As suggested by our findings, the public is very receptive to health information from a variety of sources. The task for health professionals and educators is to target health programs appropriately (taking into consideration the personal, geographic, and social context of the program recipients) and to evaluate the effects of such information on both short- and long-term health outcomes.

References.....

1. Healthy people: The Surgeon General's report on health promotion and disease prevention—background papers. DHEW Publication No. 79-55071/A. Public Health

Service, Office of the Assistant Secretary for Health and Surgeon General, Washington, DC, July 1979, pp. 1-5.

2. Breslow, L.: The potential for health promotion. *In Handbook of health, health care, and the health profession*, edited by D. Mechanic. Free Press, New York, NY, 1983, pp. 50-66.
3. Fries, J. F.: Aging, natural death, and the compression of morbidity. *N Engl J Med* 303: 130-135, 1980, July 17, 1980.

4. Becker, M. H., and Maiman, L. A.: Models of health-related behavior. *In Handbook of health, health care, and the health professions*, edited by D. Mechanic. Free Press, New York, NY, 1983, pp. 539-568.
5. U.S. Census, Pennsylvania counties, 1980 census data atlas. Pennsylvania State Data Center, Institute of State and Regional Affairs, The Pennsylvania State University, Capitol Campus, Middletown, PA, 1983.

Cancer Mortality Among Mexican Immigrants in the United States

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Synopsis

In 1980 there were more than 2 million Mexican-born immigrants living in the United States. Mortality statistics for 1979-81 indicate that the standardized mortality ratio for cancer among Mexican immigrants is 72 percent of that among

all white males and 77 percent of that among all white females. The age-adjusted death rates of the Mexican-born population for cancers of the lung, colon, rectum, bladder, and breast are significantly lower: less than 60 percent of those for the entire U.S. white population. Excessive levels of cancers of the stomach, liver, and cervix occur among Mexican-born U.S. residents; age-adjusted rates for these sites exceed the rates among the total U.S. white population by more than 75 percent.

These data, based on U.S. diagnostic practices, confirm that broad differences—twofold, for some cancer sites—exist between the cancer rates among immigrants from Mexico and other whites in the United States. The close correspondence between the mortality data presented in this study and comparable incidence data from another study indicates that differential survival does not explain the differences in cancer mortality among Mexican immigrants.

STUDIES OF CANCER MORTALITY among immigrant populations are useful as a first step in assessing the relative importance of environmental differences in carcinogenic exposure or genetic differences in susceptibility (1). The Mexican-born population in the United States, currently the largest single immigrant group in the nation, is suitable for such a study because Mexican Americans (native and foreign-born) occupy a genetically and environmentally distinct position in the population (2). Furthermore, only a few studies have examined the unusual patterns of cancer incidence and mortality of this population (1-4).

The most recent and extensive analysis of cancer mortality among the foreign-born in the United States is that of Lilienfeld and coworkers, who reviewed the mortality experience for the period 1959-61 among immigrants from 16 countries (1).

The pattern for Mexican immigrants was exceptional. Among all other groups—natives of 14 European countries and Canada as well as U.S. native whites—age-adjusted rates for all cancers among males were at least 25 percent higher than among females. Among persons born in Mexico, however, females had higher age-adjusted cancer mortality than males.

Mexican-born males had lower age-adjusted death rates than those of U.S. native whites for a majority of cancer sites, including lung cancer, the site with the highest mortality rate. Furthermore, the mortality of Mexican-born males ranked lowest of the populations from 16 countries not only for cancers of the intestines, rectum, bladder, and prostate but also for cancers of all sites combined. Compared with U.S. native white females, Mexican-born females had significantly higher age-