Trust and Sources of Health Information

The Impact of the Internet and Its Implications for Health Care Providers: Findings From the First Health Information National Trends Survey

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Background: The context in which patients consume health information has changed dramatically with diffusion of the Internet, advances in telemedicine, and changes in media health coverage. The objective of this study was to provide nationally representative estimates for health-related uses of the Internet, level of trust in health information sources, and preferences for cancer information sources.

Methods: Data from the Health Information National Trends Survey were used. A total of 6369 persons 18 years or older were studied. The main outcome measures were online health activities, levels of trust, and source preference.

Results: Analyses indicated that 63.0% (95% confidence interval [CI], 61.7%-64.3%) of the US adult population in 2003 reported ever going online, with 63.7% (95% CI, 61.7%-65.8%) of the online population having looked for health information for themselves or others at least once in the previous 12 months. Despite newly available communication channels, physicians remained the most highly trusted information source to patients, with 62.4% (95% CI, 60.8%-64.0%) of adults expressing a lot of trust in their physicians. When asked where they preferred going for specific health information, 49.5% (95% CI, 48.1%-50.8%) reported wanting to go to their physicians first. When asked where they actually went, 48.6% (95% CI, 46.1%-51.0%) reported going online first, with only 10.9% (95% CI, 9.3%-12.3%) going to their physicians first.

Conclusion: The Health Information National Trends Survey data portray a tectonic shift in the ways in which patients consume health and medical information, with more patients looking for information online before talking with their physicians.

Arch Intern Med. 2005;165:2618-2624

THE ENVIRONMENT IN WHICH patients consume medical and health information has changed dramatically during the past decade. Rapid diffusion of Internet technology within the public sphere has placed an unprecedented amount of health information within reach of general consumers.1-4 Advances in information-tailoring tools and telemedicine have broadened the reach of health care specialists beyond the constraints of the traditional office.5-7 Increases in patient advocacy and consumerism have prompted pharmaceutical companies to launch direct-to-consumer advertising campaigns, while entertainment and the news media play host to an ever-increasing breadth of health and illness discussions.8 At the same time, concerns over a digital divide, due to the uneven diffusion of health technologies, merit close monitoring by the federal government.9

On the clinical side, the appointment in May 2004 of a health information “czar” by the US Secretary of Health and Human Services to coordinate development of a National Health Information Infrastructure crystallized a commitment by the United States to make patients’ medical records universally transportable through electronic means.10,11 As a result, data entry and review systems are becoming ubiquitous in hospital settings12 and health care technologists are crafting applications in medical informatics to improve the quality of health care.13,14

Although there has been much speculation, it is unclear exactly how these changes are influencing the ways in which individuals obtain health or medical information and what patterns of trust are associated with use of different information channels.15-17 Traditionally, physicians have served a central gatekeeping role in providing health care information and services to their patients.18 With such offerings as prescription drugs19 and detailed technical information on prevention and treatment options online,20 the

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of the data into approximately equal segments. Most physicians are already experiencing the effects of patients showing up to their offices armed with printouts from the World Wide Web and requesting certain procedures, tests, or medications.

To track the dramatic changes that are occurring in the health information environment nationally, the National Cancer Institute (a component of the US National Institutes of Health) fielded the Health Information National Trends Survey (HINTS) for the first time, from October 28, 2002, to April 14, 2003. Herein, we report data from the baseline administration of this biennial survey to generate precise population estimates for the public’s use of, and trust in, different sources of health information.

METHODS

Data for the study were obtained from the 2002-2003 administration of the HINTS. Details of this survey are published elsewhere. Briefly, HINTS is a nationally representative telephone survey of persons 18 years or older, scheduled to be conducted every 2 years. Data from the survey will be used by the National Cancer Institute to monitor changes in the public’s medical information environment over time and to inform the National Cancer Institute’s communication services and research efforts.

Data for the baseline survey were collected between October 28, 2002, and April 14, 2003. A list-assisted design was used to identify household telephone numbers, telephone exchanges with high concentrations of Hispanic and black residents were oversampled to ensure adequate representation from the 2 largest minority groups in the United States. Response rates based on standards from the American Association for Public Opinion Research were 35.0% at the household screening level (ie, the initial contact with the household used for sampling purposes) and 62.8% at the sampled person interview level (ie, completion of the interview by the sampled household member). Those rates are typical of response rates found in other national telephone health surveys. A total of 6369 persons were included in the final sample.

DEFINITIONS AND MEASURES

The survey covered general content areas related to the use of different health information channels, from the television to the Internet; health behaviors; knowledge of health risks; and adherence to guidelines for healthy living. We used the information channel items to generate population estimates for persons who reported going online to access the Internet, perform tasks on the World Wide Web, or use e-mail. Trust in health information sources was assessed based on individual questions about physicians, family or friends, newspapers, magazines, radio, television, and the Internet. Respondents were asked to rate their level of trust for each source as a lot, some, a little, or not at all. Socioeconomic variables used in this study were age (18-34, 35-64, and ≥65 years), sex, race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, and other), education level (less than high school, high school graduate, some college or technical school, and college graduate or more), and annual household income level (<$25,000, $25,000-$49,999, and ≥$50,000). Income bands were based on a trichotomous split of the data into approximately equal segments.

STATISTICAL ANALYSES

Data were weighted to produce overall and stratified estimates that would be nationally representative of the US population. Weights were derived initially from selection probabilities to compensate for planned oversampling procedures. The resulting weights were then calibrated using comparable population characteristics for sex, age, race, and education from data publicly available through the Current Population Survey. A set of 50 replicate weights was produced to allow for analyses that would produce an unbiased estimation of population variance.

Analyses were conducted using SAS statistical software, version 8.2 (SAS Institute Inc, Cary, NC) and other computer software (SUDAAN, version 8.0.1); the computer software (SUDAAN) was used to account for the complex survey design and to determine appropriate standard errors and 95% confidence intervals (CIs). Cross-tabulation procedures were used to generate population-based prevalence estimates for online activities across different sociodemographic strata and to investigate levels of trust in different information sources. Logistic regression models were analyzed using computer software (SUDAAN) to investigate the relationship between sociodemographic and health care access measures (independent variables) and level of trust for each of the health information sources (dependent variable). In these models, trust was recoded as a dichotomous variable (a lot or some vs a little or not at all).

INTERNET AND HEALTH USES

To develop a profile of Internet use patterns across the sample, we identified those respondents who indicated they had ever “gone online to access the Internet or World Wide Web, or to send and receive e-mail.” From the HINTS data, we found that an estimated 63.0% (95% CI, 61.7%-64.3%) of adults (or roughly 132 million persons) reported ever using the Internet to access Web sites or to use e-mail, with a substantial majority of ever users (86.8%; 95% CI, 85.5%-88.1%) reporting personal access from home. Roughly two thirds (66.4%; 95% CI, 64.7%-68.1%) of those with home access went online through broadband connection or cable, while almost a third reported going online through broadband connections with a digital subscriber line (10.2%; 95% CI, 8.9%-11.5%) or by a home phone (22.4%; 95% CI, 20.6%-24.2%). Connection rates through wireless devices (0.4%; 95% CI, 0.2%-0.6%) or some other means (0.5%; 95% CI, 0.2%-0.9%) were negligible.

We then took the online population and generated population estimates for different activities across levels of age, sex, race/ethnicity, education, and income (Table 1). Percentages represent proportions of the online population, those with Internet access, either at home or elsewhere. Overall estimates suggest that almost two thirds, or 63.7%, of adults online looked for some type of health or medical information either for themselves or for someone else through the Internet. Use of the Internet for health or medical information was generally more common among persons who were younger than 65 years, women, those who were white or other race (eg, Asian), and those who had higher levels of education and income.
Use of the Internet for purposes besides health information seeking was much less common, with only 3.9% engaging in some other type of online activity (eg, looking up a physician’s address). TV was the least trusted health information source, with one fourth expressing a lot of trust and one fourth expressing no trust. Radio was the least trusted health information source.

**TRUST IN HEALTH INFORMATION SOURCES**

Data on trust of sources for information about cancer are listed in Table 2. Respondents expressed a high level of trust for information provided by physicians, especially in contrast to all the other sources. Trust in the Internet as a health information source was divided, with about one fourth expressing a lot of trust and one fourth expressing no trust. Radio was the least trusted health information source.

**Table 3** contains findings from logistic regression analyses in which the dichotomous outcome of high vs low trust was regressed on sociodemographic variables. Several consistent patterns emerged from these analyses. Trust in health information sources was strongly age and sex dependent, with persons aged 18 to 34 and 35 to 64 years and women generally more trusting of most sources. The differences in trust by age are especially pronounced for the Internet: adults aged 18 to 34 years were more than 10 times as likely, as those 65 years and older to report a lot or some trust in the Internet.
Level of education was also independently associated with trust of most health information sources: those with higher levels of education (ie, a high school education or greater) were more trusting of the Internet, magazines, and newspapers than persons with less than a high school education.

**PREFERRED AND ACTUAL SOURCES FOR CANCER INFORMATION**

To examine the relationship between trust and actual behavior, we turned to those items in the HINTS baseline instrument that did the following: (a) asked all respondents where they would go first for information about cancer as a specific disease type and (b) asked those who had looked for cancer information where they actually went. A striking contrast between where people preferred going and where they actually went is illustrated in the Figure.

Figure, A, clearly demonstrates that health care providers and the Internet are the dominant sources people would prefer to use first when seeking information about cancer. Overall, 48.6% (95% CI, 46.1%-51.0%) reported going to the Internet as a source of first resort, while only 10.9% (95% CI, 9.5%-12.3%) reported going to health care providers first across all ages. Those in the 18- to 34-year age range were almost 9 times more likely to go to the Internet first before going to providers (61.1% vs 7.1%). An almost equal percentage of persons 65 years and older reported going to the Internet first compared with providers first (21.4% vs 20.9%).

The first population estimate of Internet use provided by a federal scientific survey placed penetration rate for Americans 3 years and older at 22.2% in 1997. Subsequent estimates documented a steady climb to 32.7% in 1998, 44.4% in 2000, and 53.9% in 2001. Data from the first administration of the HINTS fixed the penetration rate for adults 18 years and older at 63.0% of the US adult population. That estimate is remarkably similar to data reported by the Pew Internet and American Life Project for the same period (also at 63%).

**COMMENT**

What is significant about the changeover is that the "al
findings parallel conclusions from a recent analysis of higher incomes than those who searched the least. These younger, women, and better educated, and tended to have easy-to-print materials to give others. This is the same population that is emerging picture of how the physician’s role may be perceived by the public in the changing health information environment. Respondents’ rating of trust in physicians in the HINTS data exceeded that of any other information channel for health or medical information, and the trend was strongest for respondents who were young, educated, and women. This is the same population that is online. Ongoing attention may be needed to adjust reimbursement policies for time spent with patients interpreting printouts, for accommodating shifts toward informed and shared decision making, for steering consumers to credible information sources, and for at-
tending to the needs of those who fall through the cracks of the digital divide.\textsuperscript{8,55,56}

**LIMITATIONS OF THE STUDY**

The HINTS data were derived from a nationally representative sample of structured interviews conducted by telephone. The biggest limitations of the study come from the natural liabilities of a random digit–dial telephone survey, the limitations of a self-reported and largely retrospective survey method, the unknown validity of some of the measures at baseline, and diminishing response rates in telephone surveys.\textsuperscript{31} New methods are being explored within the National Cancer Institute to complement federal survey data collection with converging sources of evidence. Techniques such as ecological momentary assessment (or real-time data collection using portable technologies), Web-based surveys, online data capture, and network analysis are being explored as complementary sources of data.\textsuperscript{57}

In conclusion, evidence from the first administration of the HINTS interview gives credence to the observation that people are turning to the World Wide Web as an information source of first resort, while relying on health care providers as their most trusted arbiter of information quality. The finding heralds a change in the information role of physicians; physicians may no longer be seen as solitary caretakers but as trusted partners in helping patients sort through information derived from an expanding network of personal and mediated information channels. Although definitive conclusions from the national study are premature—the cross-sectional nature of the survey begs the question of causality—the biennial administration of a survey designed to study the public’s use of health information should serve as an important bellwether for dramatic changes in the national health information environment.

Accepted for Publication: June 13, 2005.

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Financial Disclosure: None.

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