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Insurance Coverage & Whither Thou Goest for Health Information in 2012

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Objective: Examine use of the Internet (eHealth) and mobile health (mHealth) technologies by privately insured, publicly insured (Medicare/Medicaid), or uninsured U.S. adults in 2012.

Data Source: Pew Charitable Trust telephone interviews of a nationally representative, random sample of 3,014 adult U.S. residents, age 18+.

Methods: Estimate health information seeking behavior overall and by segment (i.e., insurance type), then, adjust estimates for individual traits, clinical need, and technology access using logistic regression.

Results: Most respondents prefer offline to online (Internet) health information sources; over half across all segments use the Internet. More respondents communicate with providers offline compared with online. Most self-reported Internet users use online tools for health information, with privately insured respondents more likely to use new technologies. Unadjusted use rates differ across segments. Medicaid beneficiaries are more likely than the privately insured to share health information online, and Medicare beneficiaries are more likely than the privately insured to text with health professionals. After adjustment, these differences were minimal (e.g., Medicare beneficiaries had odds similar to the privately insured of online physician consultations), or the direction of the association reversed (e.g., Medicaid beneficiaries had greater odds than the privately insured of online physician consultations versus lower odds before adjustment).

Discussion: Few adults report eHealth or mHealth use in 2012. Use levels appear unevenly distributed across insurance types, which could be mostly attributed to differences in individual traits and/or need. As out-of-pocket costs of medical care increases, consumers may increasingly turn to these generally free electronic health tools.

Keywords: Medicare, Medicaid, private insurance, eHealth, mHealth, health insurance, technology, surveys, interviews

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Introduction

Americans increasingly are using the Internet and mobile devices to address health needs. Electronic health (eHealth) is the use of electronic technologies to access and communicate health information that facilitates health care management.[1] Numerous eHealth tools are Internet accessible, and mobile health (mHealth) technologies, a subcategory of eHealth, are available through mobile devices (e.g. smartphones).

Earlier studies suggest that these technologies increase access to medical information (Fox & Duggan, 2013a); facilitate self-tracking of weight, diet, or exercise (Fox & Duggan, 2013b); and enable health information sharing (White, Tatonetti, Shah, Altman, & Horvitz, 2011). The Internet enables users to connect to a knowledgeable community and facilitates patient-provider communication (Beckjord *et al.*, 2007; Ginsberg, 2011). Some reports suggest that eHealth is revolutionizing the exchange of health information and the delivery of health care services (Fox & Jones, 2009).

The Department of Health and Human Services (HHS) and the Centers for Medicare & Medicaid Services (CMS) are implementing programs to capitalize on eHealth tools to improve health care delivery. For example, HHS has established several programs to nationally expand health information technology (health IT) infrastructure and to support consumer use of eHealth tools (ONC, 2013a). CMS has spent billions to encourage the use of electronic health records (EHR) and electronic drug prescriptions

[1] Our definition of eHealth is derived from both the U.S. Department of Health and Human Services (http://www.health.gov/communication/ehealth/) and the Centers for Medicare & Medicaid Services (http://www.cms.gov/eHealth/about.html)

(CMS, 2013). Both agencies are collaborating to develop meaningful use criteria to establish standards for eHealth use (ONC, 2013b).

While eHealth is intuitively appealing, little empirical data demonstrates pervasive, consistent eHealth use. The Pew Research Center finds that contrary to perceptions of universal use, 19% of U.S. adults do not use the Internet while 15% do not own a cell phone (Fox & Duggan, 2013a). Additionally, only 9% of American adults have health related software applications ("apps") on their phone (Fox, 2011).

Great enthusiasm surrounds eHealth, but some research suggests that new technologies could exacerbate existing health care disparities creating a "digital divide" (i.e., increasing differences in technology-based care between advantaged and disadvantaged groups). Knowledge, access, and willingness could be contributing sources of inequities in health technology use, but the full scope of potential factors contributing to use differences has not been identified. Pew finds that women, individuals with higher levels of education and income, non-Hispanic Whites, and younger adults are more likely to use technology and obtain health information online (Fox, 2011; Fox & Duggan, 2013a). Hsu *et al.* (2005) demonstrate disparities in eHealth use between racial/ethnic groups and by socioeconomic status (SES).

Prior research indicates that insurance matters when assessing health disparities and contemplating policy solutions in the U.S. (KFF, 2007; KFF, 2008; Mead, Cartwright-Smith, Jones, Ramos, & Siegel, 2008; KCMU, 2013). For example, Medicaid beneficiaries often have a greater illness burden or less education than the privately insured. Since insurance status frequently distinguishes vulnerable/disadvantaged patients, it could be an informative indicator for identifying populations with differential eHealth use. Feasible policy solutions may need to vary by insurance type, where separate. Tailored solutions are developed for the relevant stakeholders and population needs within the commercial insurance, Medicare, Medicaid, and uninsured groups. Presently, scarce information exists on how individuals of varying insurance types use eHealth, making it difficult to evaluate utilization by individuals with varying health care coverage.

In this report, we address a gap in the literature on eHealth by examining U.S. adult use of the Internet and mHealth across insurance types. In short, we compare use by insurance status because we wish to answer the question of whether insurance type as a group level, categorical indicator that affects patient interaction with the health care system, would be associated with technology use. Data from impartial sources, like the Pew Research Center, on the uses of eHealth are essential for policy makers seeking to track use and need. The Pew survey data is rich across a range of dimensions that allow for identifying factors that might contribute to differences in eHealth use. These associated factors could have distinct implications for innovators and policy makers (Cohen & Adams, 2011; Goel *et al.*, 2011; Hsu *et al.*, 2005). Since policy interventions often target populations according to insurance coverage, this study also contributes to the literature in assessing whether facilitating technology use primarily on the basis of insurance type could help close the "digital divide."

Methods

The Pew Charitable Trusts interviewed a nationally representative random sample of 3,014 adult U.S. residents, age 18+. Princeton Survey Research Associates, a survey firm, conducted the interviews between August 7 to September 6 in 2012 through

landline and cell phone interviews. The survey firm identified the subjects through random digit dialing (i.e., random generation of the last two digits of telephone numbers). The publicly available dataset includes sampling weights based on data for adults living in households containing a telephone in the Census Bureau's Current Population Survey (March 1999). Here we present only weighted survey responses. The survey conducted in 2012 is part of a series of fielded health related surveys that Pew has conducted every two years since 2006.

We categorized subjects into four groups according to their self-reported, primary source of health insurance in 2012: 1) Medicare; 2) Medicaid; 3) private insurance; and 4) no health insurance. In the Pew survey, subjects reported coverage through Medicare, Medicaid, private group insurance, private individual insurance, and/or other. Other included people reporting some insurance without specifying the source (i.e., military/veterans coverage). When subjects reported multiple sources of health insurance without indicating the primary source, we imposed the following hierarchy in decreasing order of priority: Medicare >Medicaid > private group insurance > private individual insurance > other > none. For example, we classified subjects reporting Medicare and Medicaid coverage (i.e., dual eligibles) as having Medicare insurance. The private health insurance group used in our analysis included subjects reporting private insurance of any type.

The interviews gathered information on individual characteristics (e.g., socio-demographic and economic traits, health status, caretaker responsibilities, and technology access). All individual covariates used reference specific Pew survey questions and their responses (details available upon request). We included age as a continuous variable. Specific survey questions distinguished Internet users from non-Internet users as well as cell phone users from non-cell phone users; these questions provided a filter in the survey for subsequent questions asked of only Internet users, only cell phone users, or combination users. We classified any subject indicating prior use of the Internet within the Pew survey as an Internet user, which provides a conservative estimate of Internet accessibility and use. The survey asked questions on text messaging behavior only among respondents who had previously indicated that they were cell phone users that sent/received text messages. Interview questions, response categories, and response data are all available on the Pew Web site (Pew Research Center, 2012).

In all models, we dichotomized educational attainment, categorizing subjects as having any college degree or no degree. We were interested in the role that clinical need due to poor health might have on outcomes, thus in the main analyses, we dichotomized the self-reported health status variable (originally on a 5-point Likert scale) into "Fair/Poor health vs. Not being in Fair/Poor health." For the subjects who reported "Don't Know" or who refused to answer, we coded them as "Not being in Fair/Poor Health." We used similar definitions to dichotomize variables representing respondents' having a chronic disease or any recent emergency health event.[2] We defined informal caregivers as anyone who reported providing unpaid care to an adult or child.

To determine the categories of Federal Poverty Level (FPL), we followed the Health and Human Services 2012 Poverty Guidelines, assigning income as the mid-point of the category. If a respondent indicated they had children, we

[2] Logistic regression analyses were performed according to dichotomized variables described here. The same analyses with identical dichotomized variables were performed with "Don't Know" and "Refused" responses coded as missing (data not shown here); this coding change did not significantly impact the results.

assumed two children lived in the household. We limited the number of adults per household to six and determined household size from the sum of the children and adults in that home. Based on income and household size, we determined the percent of federal poverty and created categorical poverty level variables.

Using logistic regression, we examined the association between insurance type and several measures of information seeking behavior to identify potential sources of variation in behavior among these populations. As a part of the regression modeling, we conducted both "unadjusted" and "adjusted" regression analyses. The "unadjusted" models only contain indicators for health insurance type. The "adjusted" models contain these insurance indicators plus the individual characteristics listed in Exhibit 1.

Results

Survey Respondents

Among the 3,014 survey respondents, 52% had private health insurance; 21% had Medicare (5% of all subjects were dual eligible for Medicare and Medicaid); 9% had Medicaid; and 18%

Exhibit 1. Survey Respondent Characteristics (Weighted)

	Private Insurance	Medicare	Medicaid	Uninsured
Unweighted sample size	1462	938	201	413
Age (mean & standard deviation)	43.0	68.7	39.7	37.5
	(15.2)	(14.4)	(14.3)	(15.5)
Female %	51.3	55.7	59.5	41.0
College degree %	53.5	28.7	17.2	18.0
Hispanic ethnicity %	9.5	7.4	21.0	27.7
White race %	77.5	79.8	56.9	63.1
Black race %	11.0	12.7	19.6	16.4
Other race %	11.5	7.5	23.5	20.6
Fair/Poor health %	11.3	35.0	33.0	21.5
Any chronic disease %	35.3	77.5	49.7	29.5
Any emergency or health shock %	24.5	22.1	54.5	30.6
Caregiver activity %	43.0	31.7	46.1	31.0
Northeast residence%	22.7	14.7	21.9	12.8
Midwest %	22.3	25.8	23.5	16.1
South %	21.5	40.3	27.2	43.5
West %	33.5	19.2	27.5	27.6
Income ≤ 100% FPL %	6.9	18.2	56.5	39.9
>100%–199% FPL %	13.1	16.0	25.0	27.7
≥200% FPL %	66.7	38.8	4.5	18.1
Unknown FPL %	13.3	27.0	14.0	14.2
Internet user %	93.4	56.1	72.1	78.9

NOTES: Respondents in the Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews, which were conducted in English and Spanish by landline (1,808) and cell phone (1,206, including 624 without a landline phone). Means and percents weighted using information from the 1999 CPS. The margin of sampling error for the complete set of weighted data is ±2.4 percentage points. For all characteristics, there were statistically significant differences ($p<0.05$) across the insurance types.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

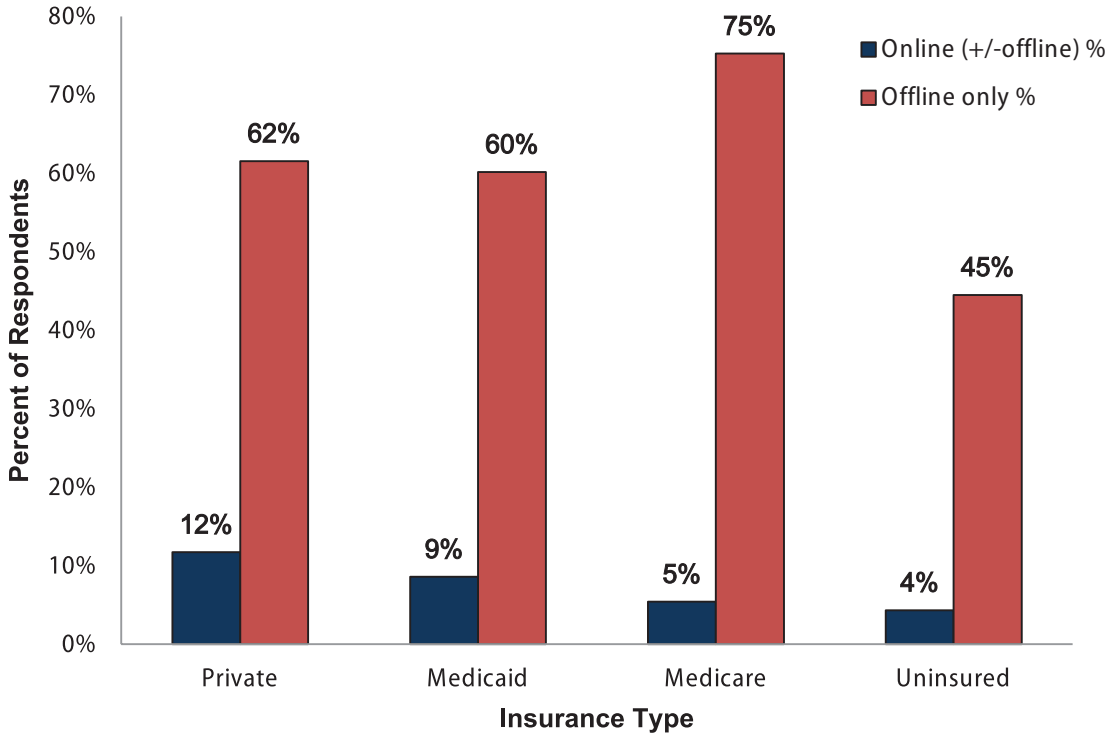
were uninsured (Exhibit 1). Subjects differed considerably by insurance type with respect to socio-demographic, economic, and clinical characteristics. The percentage of private insurance beneficiaries with college degrees (53.5%) was higher than the college-educated on Medicaid (17.2%) or who were uninsured (18%). More than half of all survey respondents were self-reported Internet users: 93% of privately insured adults and 56% of Medicare beneficiaries reported Internet use.

Communication with health care providers occurs primarily offline (WITHOUT the Internet)

> **Professional Advice (ALL RESPONDENTS):** Thinking about the LAST time you had a serious health issue or experienced any significant change in your physical health... Did you get information, care or support from a doctor or other health care professional?

All respondents were asked to indicate whether they sought professional advice (i.e., yes or no) and through what medium advice was sought (i.e., online, offline, or both online and offline). "Don't know" and "Refused" options were available. Any respondents who were non-Internet users responding yes to this question were coded as yes, offline responses. Substantially, more respondents reported seeking care through in-person visits or telephone

Exhibit 2. Percent Seeking Health Information from a Doctor, Any Online Efforts vs. Offline Only, by Insurance Type (unadjusted percent)



NOTES: Percents represent unadjusted values, weighted, using information from the 1999 CPS. Percents do not total 100 as all responses in Other were excluded from Exhibit 2. Other included "No, did not use this source," "Don't know," and "Refused." Across all measures, <3% (weighted) responded "Don't know" or "Refused." Denominator consists of all respondents including subjects reporting having each type of insurance. When subjects report having both Medicare and Medicaid (i.e., dually eligible), we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

calls than through online communication like email or Web messaging (Exhibit 2). Use of online consultations with a doctor varied across the insurance groups in unadjusted analysis (Exhibit 2), ranging from 12% of the privately insured to 4% of uninsured adults.

After adjustment (Exhibit 3), Medicare beneficiaries had similar odds of seeking online consultations with doctors as privately insured adults (unadjusted OR=0.43, 95% CI: 0.37–0.50; adjusted OR=0.97, 95% CI: 0.80–1.17). After adjustment, Medicaid beneficiaries had greater odds (adjusted OR=1.45, 95% CI: 1.17–1.81) of seeking online physician consultations than privately insured adults (vs. having lower odds before adjustment, unadjusted OR=0.71, 95% CI: 0.59–0.85).

The Internet provides a wide variety of valuable health information

Internet Health Information Searches (ONLY INTERNET USERS): Specifically, in the last 12 months, have you looked online for information about any of the following items: specific disease or medical problem; treatment or procedure; health insurance; pregnancy or childbirth; food safety or recalls; drug safety or recalls; medical test results; weight

Exhibit 3. Seeking Information Online from a Doctor (multivariate logistic model)

	OR	95%	CI
Medicaid (vs. Private)	**1.45**	1.17	1.81
Medicare (vs. Private)	0.97	0.80	1.17
None (vs. Private)	**0.67**	0.55	0.82
Age	**0.98**	0.97	0.98
Female (vs. Male)	1.11	0.99	1.23
College Degree (vs. No College Degree)	**2.22**	1.97	2.50
Hispanic (vs. non-Hispanic)	**0.77**	0.64	0.93
Black (vs. White)	**1.26**	1.07	1.49
Other (vs. White)	**1.51**	1.29	1.76
Fair/Poor health (vs. Not)	**0.80**	0.68	0.94
Any Chronic Dx (vs. None)	**1.64**	1.45	1.86
Any Emergency or Health Shock (vs. None)	**1.64**	1.45	1.85
Active Caregiver (vs. Not a Caregiver)	**2.23**	2.00	2.49
Midwest (vs. Northeast)	**1.57**	1.32	1.88
South (vs. Northeast)	**1.58**	1.34	1.86
West (vs. Northeast)	**2.12**	1.78	2.52
>100%–199% FPL (vs. ≤100% FPL)	**1.75**	1.38	2.22
≥200% FPL (vs. ≤100% FPL)	**4.01**	3.22	5.00
Unknown FPL (vs. ≤100% FPL)	**2.53**	1.98	3.24

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

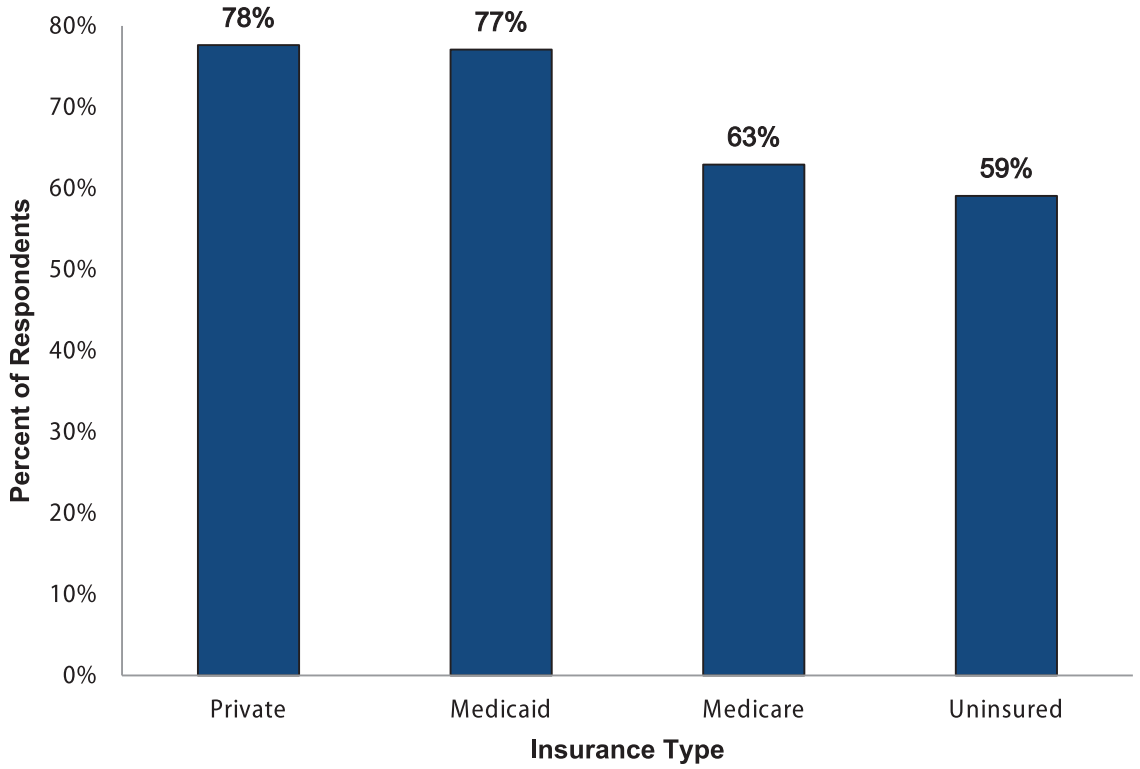
control; reduction of my health care costs; caring for an aging relative or friend; a drug that I saw advertised; or any other health issue.

Only self-reported Internet users were asked to respond yes, no, don't know, or refused for each of the items listed in the above question. Over 50% of Internet users sought health information online. The unadjusted percent that went online for health information for any reason varied by insurance type with 77–78% of Medicaid and private insurance beneficiaries reporting this behavior while 59% of the uninsured behaved similarly (Exhibit 4).

After adjustment, Medicare beneficiaries had similar odds of conducting online health information searches as did privately insured respondents (unadjusted OR= 0.49, 95% CI: 0.44–0.54; adjusted OR=0.90, 95% CI: 0.79–1.02, Exhibit 5).

Medicaid beneficiaries had odds of this behavior comparable to privately insured respondents before and after adjustment (Exhibit 5). Females (OR=2.03 females vs. males, 95% CI: 1.87–2.20, Exhibit 5) and individuals providing uncompensated care for another person (OR=2.67 for active caregivers vs. non-caregivers, 95% CI: 2.45–2.91, Exhibit 6) were more likely to look online for health information.

Exhibit 4. Percent Seeking Health Information Online for Any Reason, by Insurance Type (Unadjusted Percent)



NOTES: Percents represent unadjusted values of online use for any of the listed reasons in the survey, weighted, using information from the 1999 CPS. Across all measures, <1% responded "Don't know" or "Refused." Denominator consists of all subjects reporting having insurance of each type AND who reported being Internet users. When subjects report having both Medicare and Medicaid (i.e., dually eligible), we classified them as having Medicare.

SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Exhibit 5. Seeking Health Information Online for Any Reason (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	1.09	0.92	1.30
Medicare (vs. Private)	0.90	0.79	1.02
None (vs. Private)	**0.60**	0.54	0.68
Age	**0.98**	0.97	0.98
Female (vs. Male)	**2.03**	1.87	2.20
College Degree (vs. No College Degree)	**1.94**	1.78	2.12
Hispanic (vs. non-Hispanic)	**0.80**	0.70	0.90
Black (vs. White)	0.96	0.85	1.09
Other (vs. White)	1.13	1.00	1.28
Fair/Poor health (vs. Not)	1.09	0.96	1.23
Any Chronic Dx (vs. None)	**1.24**	1.13	1.36
Any Emergency or Health Shock (vs. None)	**1.91**	1.73	2.11
Active Caregiver (vs. Not a Caregiver)	**2.67**	2.45	2.91
Midwest (vs. Northeast)	**0.69**	0.61	0.78
South (vs. Northeast)	**0.82**	0.73	0.92
West (vs. Northeast)	1.12	0.99	1.27
>100%–199% FPL (vs. ≤100% FPL)	**1.91**	1.67	2.19
≥200% FPL (vs. ≤100% FPL)	**2.27**	1.99	2.58
Unknown FPL (vs. ≤100% FPL)	**1.31**	1.13	1.51

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Medicaid beneficiaries more likely than the privately insured to share health information online

> **Online Information Sharing (ONLY INTERNET USERS):** Still thinking just about the last 12 months, have you posted a health-related question online or shared your own personal health experience online in any way?

Only self-reported Internet users were asked to respond yes, no, don't know, or refused to the above question. Few respondents reported sharing information online (Exhibit 7), regardless of insurance type. The unadjusted percent of Medicaid beneficiaries (16%) that shared information online was approximately double the 6–7% of Medicare beneficiaries, the uninsured, or the privately insured that reported similar behavior.

After adjustment (Exhibit 8), Medicare beneficiaries had odds of sharing information online comparable to the privately insured (unadjusted OR= 0.81, 95% CI: 0.67–0.98; adjusted OR=1.19, 95% CI: 0.94–1.49). Medicaid beneficiaries were more likely to share information online than were privately insured individuals before and after accounting for individual characteristics (Exhibit 8).

Exhibit 6. mHealth Use Through Phone Applications, Among Subjects with a Cell Phone (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	**0.53**	0.42	0.67
Medicare (vs. Private)	**0.58**	0.45	0.75
None (vs. Private)	**0.52**	0.44	0.62
Age	**0.96**	0.96	0.97
Female (vs. Male)	**1.33**	1.20	1.49
College Degree (vs. No College Degree)	**1.51**	1.35	1.70
Hispanic (vs. non-Hispanic)	0.91	0.76	1.08
Black (vs. White)	**1.24**	1.05	1.45
Other (vs. White)	**1.42**	1.22	1.66
Fair/Poor health (vs. Not)	0.92	0.77	1.10
Any Chronic Dx (vs. None)	**1.17**	1.03	1.32
Any Emergency or Health Shock (vs. None)	**1.74**	1.54	1.95
Active Caregiver (vs. Not a Caregiver)	**1.37**	1.23	1.52
Internet user (vs. non-Internet user)	**3.58**	2.40	5.34
Midwest (vs. Northeast)	1.16	0.97	1.38
South (vs. Northeast)	**1.40**	1.20	1.64
West (vs. Northeast)	**1.63**	1.38	1.92
>100%–199% FPL (vs. ≤100% FPL)	**1.85**	1.52	2.26
≥200% FPL (vs. ≤100% FPL)	**1.88**	1.55	2.28
Unknown FPL (vs. ≤100% FPL)	**1.63**	1.30	2.06

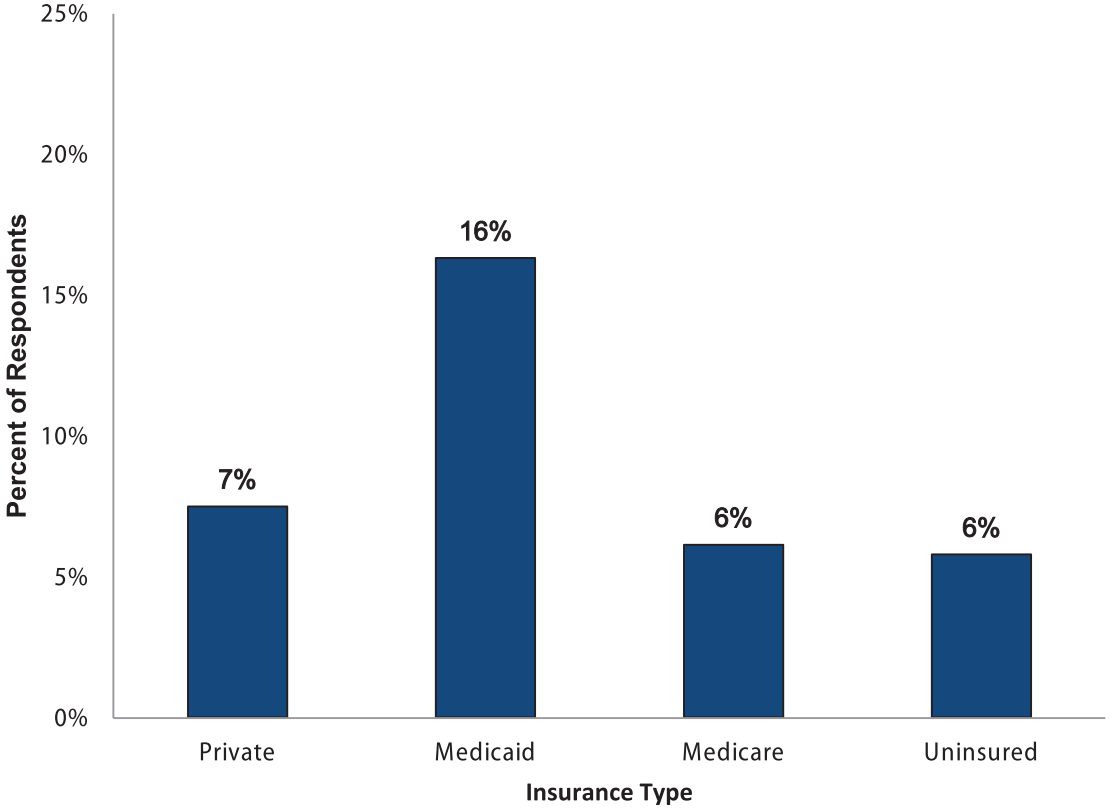
NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance.
Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) Telephone Interviews.

Privately insured adults more likely than all others to use mHealth on their cell phones

> **Self-Management mHealth Tools (ALL CELL PHONE USERS):** On your cell phone, do you happen to have any software applications or "apps" that help you track or manage your health, or not?

Only self-reported cell phone users were asked to respond yes, no, don't know, or refused to the above question. The majority of survey respondents had a cell phone and a landline phone. Over 75% of privately insured adults and slightly over 50% of each of the other insurance groups had a cell phone. More than half of adults from all insurance groups except for those on Medicare (20%) accessed the Internet from a cell phone, tablet, or other mobile handheld device. More than 85% of cell phone users from all insurance types did not use mHealth applications on their cell phones (Exhibit 9). Among cell phone users, 15% of

Exhibit 7. Percent Sharing Health Information Online, by Insurance Type (Unadjusted Percent)



NOTES: Percents represent unadjusted values, weighted, using information from the 1999 CPS. Across all measures, <1% responded "Don't know" or "Refused." Denominator consists of all subjects reporting having insurance of each type AND who reported being Internet users. When subjects report having both Medicare and Medicaid (i.e., dually eligible), we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

privately insured adults, five times as many Medicare beneficiaries (3%), used health "apps" on their mobile devices. The unadjusted percent of privately insured adults using mHealth was almost double the share of Medicaid beneficiaries and the uninsured using health "apps" on their cell phones. The magnitude of these differences in mHealth use by insurance type decreased after adjustment (e.g., OR= 0.58 for Medicare vs. privately insured adults, 95% CI: 0.45–0.75; OR= 0.53 for Medicaid vs. privately insured adults, 95% CI: 0.42–0.67; OR= 0.52 for the uninsured vs. privately insured adults, 95% CI: 0.44–0.62, Exhibit 6).

Medicare beneficiaries more likely than privately insured adults to text with health care professionals

> **Text Communication (ONLY CELL PHONE USERS WHO SEND/RECEIVE TEXTS):** Do you receive any TEXT updates or alerts about health or medical issues, such as from your doctors or pharmacists?

Only self-reported cell phone users who send/receive texts were asked to respond yes, no, don't know, or refused to the above question. Few respondents reported receiving text messages

Exhibit 8. Sharing Health Information Online (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	**2.15**	1.74	2.66
Medicare (vs. Private)	1.19	0.94	1.49
None (vs. Private)	**0.81**	0.66	1.00
Age	**0.98**	0.97	0.98
Female (vs. Male)	**1.39**	1.22	1.59
College Degree (vs. No College Degree)	**1.70**	1.48	1.95
Hispanic (vs. non-Hispanic)	**1.57**	1.30	1.89
Black (vs. White)	**0.62**	0.50	0.76
Other (vs. White)	**0.53**	0.43	0.65
Fair/Poor health (vs. Not)	**0.81**	0.68	0.97
Any Chronic Dx (vs. None)	**1.75**	1.51	2.02
Any Emergency or Health Shock (vs. None)	**2.25**	1.97	2.58
Active Caregiver (vs. Not a Caregiver)	**1.63**	1.43	1.85
Midwest (vs. Northeast)	**1.37**	1.11	1.69
South (vs. Northeast)	**1.36**	1.12	1.65
West (vs. Northeast)	**1.74**	1.43	2.12
>100%–199% FPL (vs. £100% FPL)	**1.74**	1.41	2.14
³200% FPL (vs. £100% FPL)	**1.31**	1.06	1.63
Unknown FPL (vs. ≤100% FPL)	1.27	0.98	1.64

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.

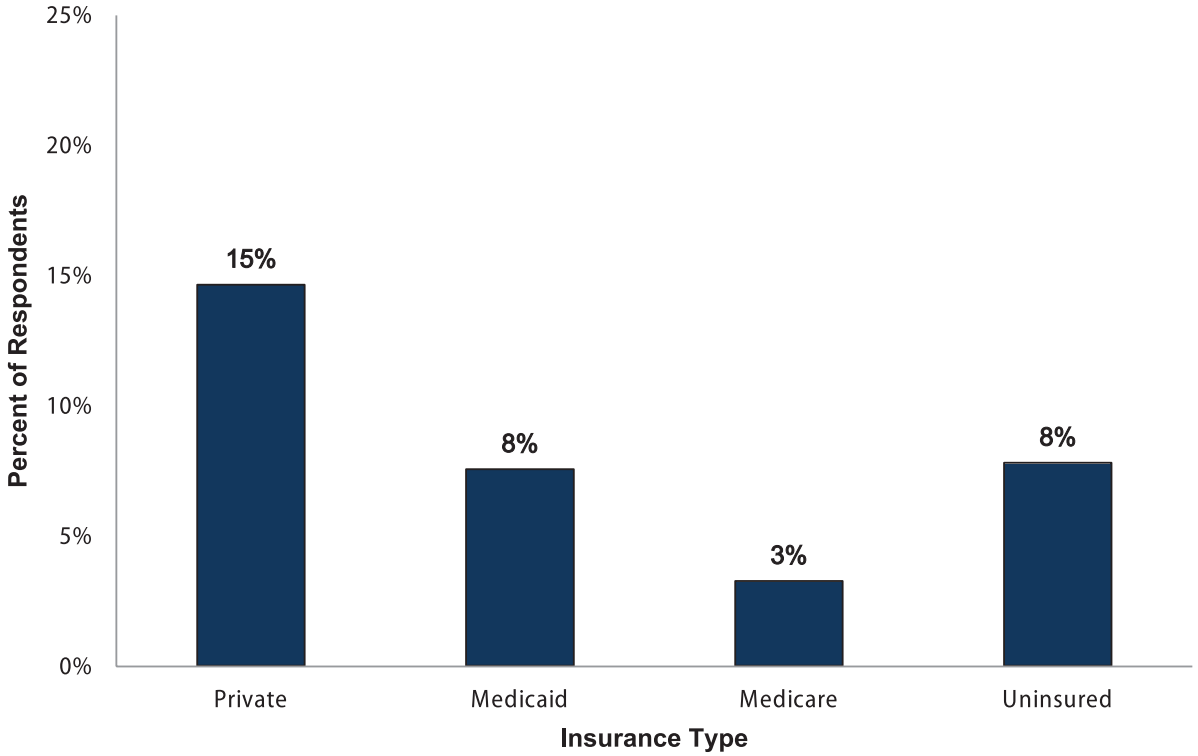
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

from health professionals (Exhibit 10). More Medicare beneficiaries (23%) reported receiving text messages than did privately insured adults. Before and after adjustment (Exhibit 11), Medicare beneficiaries were more likely to have received text updates or alerts about health or medical issues from doctors or pharmacists than respondents with private insurance coverage (unadjusted OR= 3.10, 95% CI: 2.64–3.63; adjusted OR=2.65, 95% CI: 2.18–3.23).

Discussion

We examined the use of the Internet and mHealth to obtain health information among adults who were privately insured, publicly insured (Medicare or Medicaid), or uninsured. Adults with different insurance coverage vary in their individual, family, and medical traits, as confirmed in the survey sample. We found substantial differences in Internet and mHealth use among adults in our insurance-based groups, which were strongly associated with differences in individual and clinical traits (for additional analysis, see Supplement, Exhibits A1–A6). After adjustment, we found fewer differences in use by insurance type (e.g., Medicare beneficiaries had similar odds of specific health information behaviors), and the direction of some associations changed (e.g., reversal in the association where Medicaid beneficiaries became more likely

Exhibit 9. Percent Reporting mHealth Usage through Cell Phone Applications, by Insurance Type (unadjusted percent)



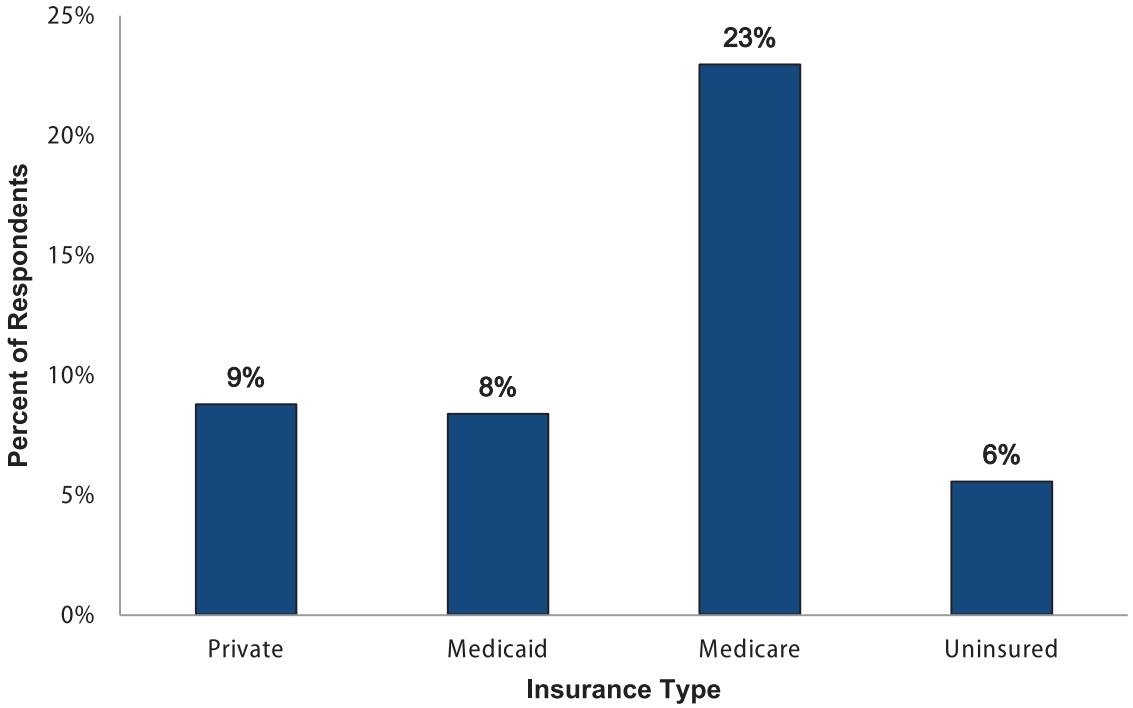
NOTES: Percents represent unadjusted values of mHealth use through cell phone apps, weighted, using information from the 1999 CPS. Across all measures, <1% responded "Don't know" or "Refused." Denominator consists of all subjects reporting having insurance of each type AND who report having a cellular telephone. When subjects report having both Medicare and Medicaid (i.e., dually eligible) we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

to seek information online from a doctor than privately insured adults after adjustment).

Therefore, we found that insurance type alone does not explain the variation observed in eHealth. Though insurance might be an informative predictor of eHealth use, our results suggest that any evaluations of insurance type and technology use among population subgroups cannot ignore the variation due to individual socio-demographic factors. Policy interventions often target populations according to insurance coverage, but our results suggest that future policies to facilitate technology use targeted to insurance groups alone will not address all major contributing sources to technology use variation.

Our results showing that eHealth use remains limited despite access to the Internet and cell phones are consistent with the literature implying that access alone cannot explain differences in utilization by insurance type (Fung *et al.*, 2006; Span, 2013). Our results also reiterate that even after accounting for insurance and income, disparities in access to technology-based care remain. These findings suggest that more investigations are needed to explain the digital divide with respect to eHealth. The Pew Research Center survey provides valuable, impartial information about how Americans use eHealth, and this study indicates how insurance type might be associated with that use. Consistent assessment of use will provide

Exhibit 10. Percent Reporting Texting with Health Professionals, by Insurance Type (Unadjusted Percent)



NOTES: Percents represent unadjusted values of respondent texting with health professionals, weighted, using information from the 1999 CPS. Across all measures, <1% responded "Don't know" or "Refused." Denominator consists of all subjects reporting having insurance of each type AND who report having a cellular telephone. When subjects report having both Medicare and Medicaid (i.e., dually eligible) we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

knowledge on how to employ and target eHealth tools within the health care system.

The Pew data and this study have notable limitations. The survey results are based on self-reported behaviors, which are subject to recall bias and could be correlated with other traits (e.g., level of need). Due to our cross-sectional study design, our study is limited to a descriptive analysis representing associations rather than any causal inferences.

In conclusion, eHealth and mHealth tools represent promising technologies to promote health and potentially improve the efficiency of care delivery (e.g., provide comparable health at lower cost). These tools are in their early stages, with open questions concerning equity in access, frequency of use, and net impact. These interviews offer hints of first steps to bridge the technological divide, and, thus, improve medical care while lowering costs of health care delivery (DeBronkart, 2013; Jackson, 2013; Steinhubl, Muse, & Topol, 2013).

Disclaimer

The authors have been requested to report any funding sources and other affiliations that may represent a conflict of interest. The statements contained in this manuscript are solely those of the authors and do not necessarily reflect the views or policies of neither the Centers for Medicare & Medicaid Services nor the Department of Health and Human Services. The authors assume responsibility for the accuracy and completeness of the information contained in this manuscript.

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Exhibit 11. Texting with Health Care Professionals (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	0.79	0.61	1.02
Medicare (vs. Private)	**2.65**	2.18	3.23
None (vs. Private)	**0.67**	0.54	0.83
Age	1.00	0.99	1.00
Female (vs. Male)	**1.63**	1.44	1.86
College Degree (vs. No College Degree)	**1.42**	1.24	1.63
Hispanic (vs. non-Hispanic)	**0.73**	0.59	0.91
Black (vs. White)	**1.47**	1.23	1.75
Other (vs. White)	**1.46**	1.21	1.75
Fair/Poor health (vs. Not)	0.93	0.78	1.12
Any Chronic Dx (vs. None)	**1.72**	1.50	1.99
Any Emergency or Health Shock (vs. None)	**1.20**	1.04	1.38
Active Caregiver (vs. Not a Caregiver)	**1.92**	1.69	2.18
Internet user (vs. non-Internet user)	**0.67**	0.53	0.85
Midwest (vs. Northeast)	1.02	0.83	1.27
South (vs. Northeast)	**1.29**	1.07	1.56
West (vs. Northeast)	**1.56**	1.28	1.91
>100%-199% FPL (vs. ≤100% FPL)	**1.44**	1.17	1.77
≥200% FPL (vs. ≤100% FPL)	1.04	0.84	1.29
Unknown FPL (vs. ≤100% FPL)	**0.46**	0.34	0.62

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.

SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

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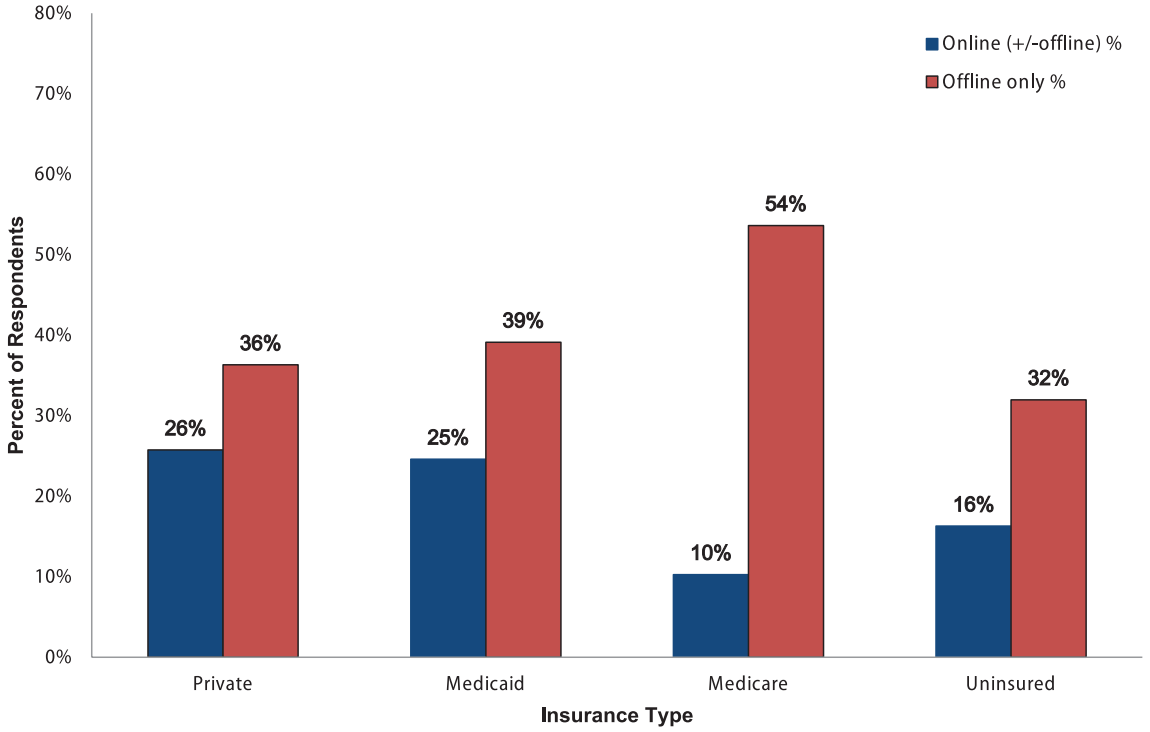
SUPPLEMENT

This supplement includes analysis of additional Pew survey questions on health information seeking behavior. For each survey question, the question text is presented specifying which respondents the question was directed to. Unadjusted responses are presented in a figure immediately following each survey question. Finally, adjusted logistic regression results are included in tabular format.

Advice from Friends and Family Question Asked of ALL RESPONDENTS: Thinking about the LAST time you had a serious health issue or experienced any significant change in your physical health... Did you get information, care, or support from friends or family?

Advice from Others with Comparable Conditions Question Asked of ALL RESPONDENTS: Thinking about the LAST time you had a serious health issue or experienced any significant change in your physical health...Did you get information, care or support from others who have the same health condition?

Exhibit A1. Percent Seeking Health Information from Friends and Family, Any Online Efforts vs. Offline Only, by Insurance Type (Unadjusted Percent)



NOTES: Percents represent unadjusted values weighted using information from the 1999 CPS. Percents do not total 100 as all responses in Other were excluded from Exhibit 4. Other included "No, did not use this source," "Don't know," and "Refused." Across all measures, <3% (weighted) responded "Don't know," or "Refused." Denominator consists of all respondents including subjects reporting having each type of insurance. When subjects report having both Medicare and Medicaid (i.e., dually eligible), we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

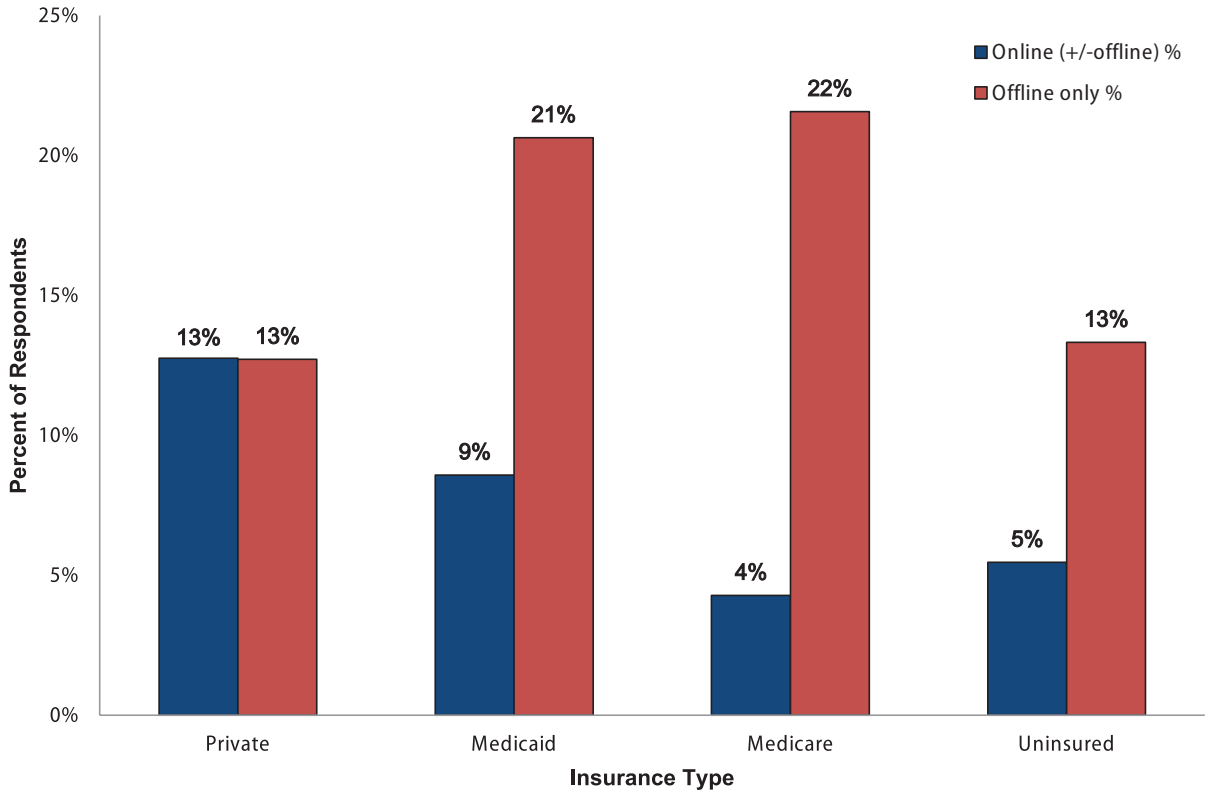
Internet Self-Diagnosis Question Asked of ALL INTERNET USERS: Have you ever gone online specifically to try to figure out what medical condition you or someone else might have?

Exhibit A2. Seeking Information from Friends and Family Through the Internet (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	**1.41**	1.21	1.63
Medicare (vs. Private)	1.12	0.97	1.29
None (vs. Private)	**0.86**	0.76	0.97
Age	**0.97**	0.96	0.97
Female (vs. Male)	**1.40**	1.29	1.51
College Degree (vs. No College Degree)	**1.84**	1.70	2.01
Hispanic (vs. non-Hispanic)	0.90	0.80	1.02
Black (vs. White)	**0.66**	0.58	0.75
Other (vs. White)	1.01	0.90	1.14
Fair/Poor health (vs. Not)	**0.74**	0.65	0.83
Any Chronic Dx (vs. None)	1.07	0.97	1.17
Any Emergency or Health Shock (vs. None)	**1.67**	1.53	1.83
Active Caregiver (vs. Not a Caregiver)	**2.12**	1.96	2.29
Midwest (vs. Northeast)	**1.19**	1.05	1.34
South (vs. Northeast)	0.92	0.83	1.03
West (vs. Northeast)	**1.18**	1.05	1.33
>100%–199% FPL (vs. ≤100% FPL)	**1.35**	1.18	1.55
≥200% FPL (vs. ≤100% FPL)	**2.06**	1.80	2.35
Unknown FPL (vs. ≤100% FPL)	**0.77**	0.65	0.91

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Exhibit A3. Percent Seeking Health Information from Others with the Same Medical Condition, Any Online Efforts vs. Offline Only, by Insurance Type (Unadjusted Percent)



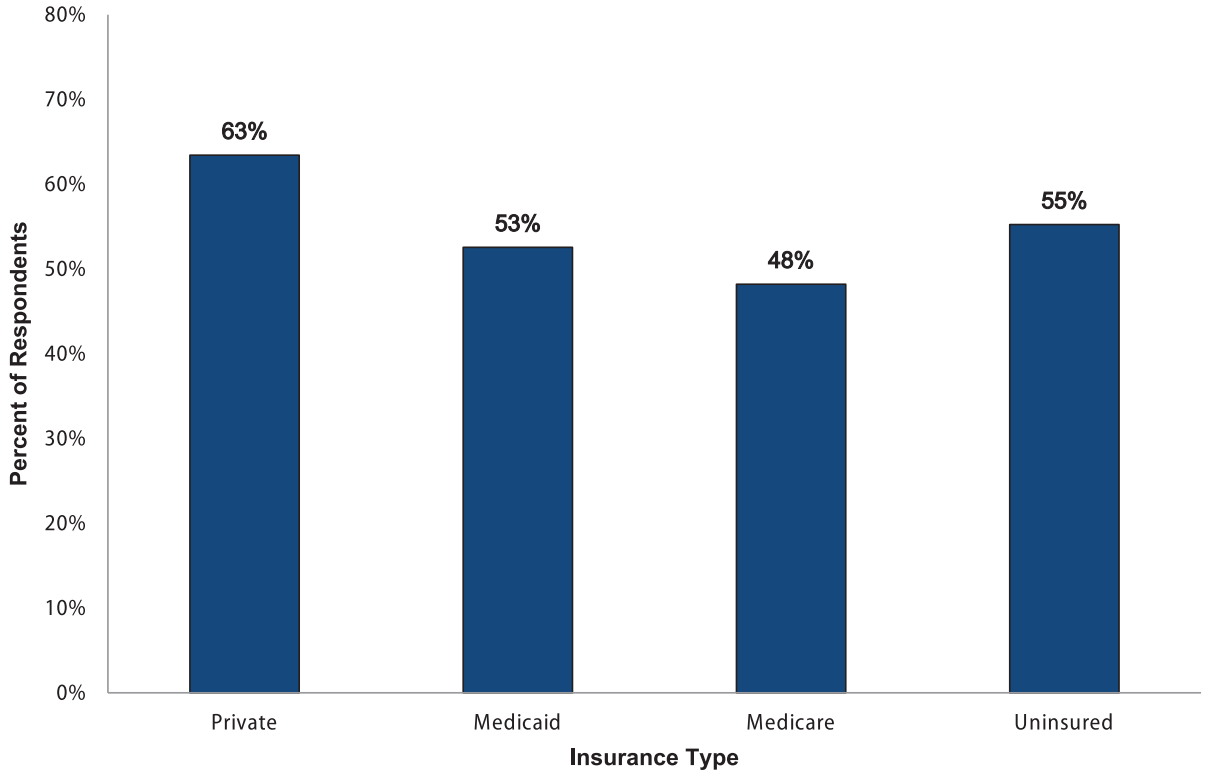
NOTES: Percents represent unadjusted values weighted using information from the 1999 CPS. Percents do not total 100 as all responses in Other were excluded from Exhibit 7. Other included "No, did not use this source," "Don't know," and "Refused." Across all measures, <3% (weighted) responded "Don't know," or "Refused." Denominator consists of all respondents including subjects reporting having each type of insurance. When subjects report having both Medicare and Medicaid (i.e., dually eligible), we classified them as having Medicare.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Exhibit A4. Seeking Information Online from Others with the Same Medical Condition (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	0.99	0.79	1.22
Medicare (vs. Private)	0.99	0.81	1.21
None (vs. Private)	**0.61**	0.50	0.73
Age	**0.96**	0.96	0.97
Female (vs. Male)	**1.54**	1.38	1.71
College Degree (vs. No College Degree)	**1.56**	1.39	1.75
Hispanic (vs. non-Hispanic)	**0.63**	0.52	0.76
Black (vs. White)	1.08	0.92	1.26
Other (vs. White)	0.88	0.74	1.05
Fair/Poor health (vs. Not)	**0.64**	0.54	0.76
Any Chronic Dx (vs. None)	**1.13**	1.00	1.28
Any Emergency or Health Shock (vs. None)	**2.24**	2.00	2.51
Active Caregiver (vs. Not a Caregiver)	**1.46**	1.31	1.62
Midwest (vs. Northeast)	0.92	0.78	1.09
South (vs. Northeast)	0.99	0.85	1.14
West (vs. Northeast)	1.15	0.99	1.35
>100%–199% FPL (vs. ≤100% FPL)	**1.59**	1.30	1.94
≥200% FPL (vs. ≤100% FPL)	**2.71**	2.23	3.29
Unknown FPL (vs. ≤100% FPL)	1.15	0.90	1.47

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Exhibit A5. Percent Attempting a Self-Diagnosis Through the Internet, by Insurance Type (Unadjusted Percent)



NOTES: Percents represent unadjusted values of online use for any of the listed reasons in the survey, weighted, using information from the 1999 CPS. Across all measures, <1% responded "Don't know" or "Refused." Denominator consists of all subjects reporting having insurance of each type AND who report being Internet users. When subjects report having both Medicare and Medicaid (i.e., dually eligible) we classified them as having Medicare.

SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.

Exhibit A6. Attempt at Self-Diagnosis Through Online Search (Multivariate Logistic Model)

	OR	95%	CI
Medicaid (vs. Private)	**0.63**	0.53	0.74
Medicare (vs. Private)	0.87	0.76	1.00
None (vs. Private)	**0.72**	0.63	0.82
Age	**0.97**	0.97	0.98
Female (vs. Male)	**1.33**	1.22	1.44
College Degree (vs. No College Degree)	**1.34**	1.23	1.46
Hispanic (vs. non-Hispanic)	**0.72**	0.63	0.82
Black (vs. White)	**0.85**	0.75	0.97
Other (vs. White)	**0.77**	0.68	0.87
Fair/Poor health (vs. Not)	**1.18**	1.04	1.33
Any Chronic Dx (vs. None)	**1.17**	1.06	1.28
Any Emergency or Health Shock (vs. None)	**1.18**	1.08	1.29
Active Caregiver (vs. Not a Caregiver)	**1.40**	1.29	1.52
Midwest (vs. Northeast)	**1.13**	1.00	1.28
South (vs. Northeast)	1.01	0.90	1.13
West (vs. Northeast)	**1.14**	1.01	1.28
>100%-199% FPL (vs. ≤100% FPL)	**1.61**	1.39	1.86
≥200% FPL (vs. ≤100% FPL)	**1.41**	1.22	1.62
Unknown FPL (vs. ≤100% FPL)	**1.27**	1.08	1.51

NOTES: The logistic regression model: The model represented in the set of columns shows the OR for reporting this outcome among Medicare, Medicaid, and uninsured respondents compared to the reference group with private insurance. Age is continuous, so the corresponding OR is for a 1-year increase in age. The model includes additional covariates for geographic region and annual household income relative to the federal poverty level (FPL). All numbers in bold represent odds ratios that are statistically significant ($p<0.05$) at the 95% confidence level.
SOURCE: Pew Research Center's 2012 Health Survey (Internet & American Life Project) telephone interviews.