Direct-to-Consumer Advertising: Public Perceptions of Its Effects on Health Behaviors, Health Care, and the Doctor-Patient Relationship

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Purpose: **To determine public perceptions of the effect of direct-to-consumer advertising (DTCA) of prescription medications on health behaviors, health care utilization, the doctor-patient relationship, and the association between socioeconomic status and these effects.**

Methods: **Cross-sectional survey of randomly selected, nationally representative sample of the US public using computer-assisted telephone interviewing. Main outcome measures: numbers and proportions of respondents in the past 12 months who, as a result of DTCA, requested preventive care or scheduled a physician visit; were diagnosed with condition mentioned in advertisement; disclosed health concerns to a doctor; felt enhanced confidence or sense of control; perceived an effect on the doctor-patient relationship; requested a test, medication change, or specialist referral; or manifested serious dissatisfaction after a visit to a doctor.**

Results: **As a result of DTCA, 14% of respondents disclosed health concerns to a physician, 6% requested preventive care, 5% felt more in control during a physician visit; 5% made requests for a test, medication change, or specialist referral, and 3% received the requested intervention. One percent of patients reported negative outcomes, including worsened treatment, serious dissatisfaction with the visit, or that the physician acted challenged. Effects of DTCA were greater for respondents with low socioeconomic status.**

Conclusions: **DTCA has positive and negative effects on health behaviors, health service utilization, and the doctor-patient relationship that are greatest on people of low socioeconomic status. The benefits of DTCA in terms of encouraging hard-to-reach sections of the population to seek preventive care must be balanced against increased health care costs caused by clinically inappropriate requests generated by DTCA. (J Am Board Fam Pract 2004;17:6–18.)**

Direct-to-consumer advertising (DTCA) of prescription medications may have beneficial or harmful effects on patients, their relationship with physicians, and the health care system.[1–9] So far, there are few empirical data on the actual effects of DTCA, and available data are limited by small samples,[10] selected populations,[11] hypothetical scenarios,[12] or have been criticized on methodological grounds.[13,14]

In an article published in the last issue of the *Journal of the American Board of Family Practice*, we examined the effects of DTCA on quality of care, health service utilization, and physician perceptions of its impact on the doctor-patient relationship.[15] In this article, we use the data from a large telephone survey of a nationally representative sample of the American public to test hypotheses concerning the effects of DTCA on health behaviors, patients' perceptions of its impact on the doctor-patient relationship and on the health care system, and the extent to which these effects are mediated by socioeconomic status.

Methods

Development of Testable Hypotheses

We undertook a literature review to identify published claims about the effects of DTCA and formulate testable hypotheses.[15]

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Sample

The survey was conducted between March 2000 and March 2001 on a household probability sample from the 48 contiguous states by using random-digit dialing to select households and a random selection method to select one respondent aged 18 or over for interview in each sample household. Verbal informed consent was obtained from all respondents before they began the interview. Eligibility was limited to English and Spanish speakers without cognitive or physical impairments that prevented completion of the interview. A small financial incentive was offered for completion of the interview. At least 15 attempts were made to call nonresponders, and where telephone numbers of nonrespondents could be matched with an address, up to 2 letters were sent to encourage response. The average administration time was 20 minutes. All interviews were conducted by trained interviewers using computer-assisted telephone interviewing (CATI).

An oversample of persons in poor health was achieved by screening a random subsample of households and including only those respondents who described their health as fair or poor (rather than excellent, very good, or good); had a disability or handicap that prevented them from participating fully in school, work, housework, or other activities; or had been hospitalized within the past 12 months, for reasons other than a normal delivery of a child. A total of 2720 interviews were completed in the nonoversample portion of the study, representing a completion rate of 72% and a response rate of 54%, and 489 interviews were completed in the oversample (completion rate, 95%; response rate, 51%).

Data were weighted to adjust for unequal probability of selection (including the oversample of persons in poor health). To adjust for survey nonresponse, stratification weights were developed using the March 2000 Current Population Survey from the US Census Bureau as standard. The post-stratification weights were based on gender within age within race, as well as education, health insurance status (insured versus uninsured), and household size.

Interview and Data Collection

The interview was developed after literature review and focus group participation and piloted to ensure all questions were easily understood and contained no ambiguities. In the preamble, it was described as a survey on health issues, in particular how Americans make decisions about health care and their feelings about the health care available to them. No mention of DTCA was made in characterizing the survey. Initial questions inquired into respondents' use of different sources of health information, approaches to health information, and relationships with their physicians. Respondents were then asked about their experience of searching the Internet for health information, because this was the primary focus of the project. Once questions about the Internet were completed, respondents were asked for their experiences of DTCA, whether they had encountered an advertisement that was personally relevant, and their response to that advertisement. Respondents who had sequentially seen an advertisement for a prescription medication in the past 12 months, perceived it as personally relevant, and discussed the information in this advertisement with their physician were asked about the last time they had done this. To avoid overloading respondents, those who had already answered questions about taking health information from the Internet to a visit with their doctor (n = 82) were not asked about the last occasion on which they had discussed information in an advertisement with their doctor.

Demographic and socioeconomic data, including age, self-defined ethnic origin, educational achievement, household income per annum, health insurance status, and current health status were collected from all respondents. Respondents were defined as being proactive about health care information if they stated that they went out of their way to look for information on health topics of personal relevance, rather than simply reading it if they came across it or not reading any such information.

Analysis

Dependent variables organized by hypothesis are summarized in Table 1. These variables include the kinds of requests made to physicians based on DTCA, the responses received to such requests, characteristics of the doctor-patient exchange over such requests, and the outcomes from the exchange. In addition, we included the doctor's acting challenged as an important outcome variable, because it had been established as such in our previous work.[16] We postulated that the doctor's acting challenged could indicate either that the doctor felt challenged by interacting with an activated,

Table 1. Summary of Hypotheses Tested, Dependent Variables Used to Test Each Hypothesis, Total Number of Respondents Experiencing Each Outcome, and Association with Socioeconomic Status

Hypothesis*: That DTCA would result in:	DV	N (% of Total Population)† [95% CI]	Significant Associations (see text for details)
Clinical benefits and harms			
More patients attending physicians for preventive health care.	Respondent requested preventive care from a health professional	203 (6.3%) [5.3–7.5%]	Low education, Hispanic, chronic disease
	Respondent attended physician or other health professional for a check-up	189 (5.9%) [5.0–6.9%]	Low education, Hispanic, chronic disease
Increased diagnoses of currently under-diagnosed conditions.	Respondent diagnosed with, or told at risk of, condition mentioned in advertisement during or after consultation	28 (0.9) [0.6–1.3%]	Being in managed care, no SES association
Improved treatments of currently under-treated conditions.	Respondent given medication mentioned in advertisement and doctor said it would benefit patient.	67 (2.1%) [1.6–2.8%]	Low education, low income, not proactive about health information
Worsened treatment	Respondents given medication requested but doctor said it would not benefit patient	26 (0.8%) [0.5–1.2]	Age 18–24
Psychosocial benefits			
Increased sense of confidence and control by patient during physician visit.	Respondent felt more confident during visit as a result of DTCA	142 (4.4%) [3.7–5.4%]	No SES association
	Respondent felt more in control during visit as a result of DTCA	168 (5.2%) [4.4–6.2%]	Women, not proactive about health information
Effect on doctor-patient relationship			
Enhanced disclosure of health concerns to doctor	Respondent disclosed health concerns to physician as a result of DTCA	455 (14.2%) [12.8–15.8%]	Low income, nonwhite, chronic disease, proactive about health information
Changed global rating of relationship	Respondent's assessment of effect of discussing information from DTCA on doctor-patient relationship		
	Improved	51 (1.6%) [1.2–2.2%]	Change in relationship associated with SES.
	Neutral	163 (5.1) [4.3–6.0%]	
	Worsened	11 (0.3) [0.1–1.0%]	Worsened relationship associated with the request's not being filled.
Failure by patient to acknowledge doctor's expertise or doctor experiencing difficulty with knowledgeable/activated patient	Doctor acted challenged	30 (0.9%) [0.6–1.4%]	Low education
Serious dissatisfaction by patient	Respondent sought 2nd opinion, changed doctor or health plan)	46 (1.4%) [1.0–2.2%]	Low SES, no relationship with having request filled.
Effects on health care system			
Increased costs, without commensurate health gains.	Number of respondents who scheduled visit to physician to discuss ad	55 (1.7%) [1.2–2.4%]	Low education, being in managed care
	Number of respondents who made specific requests	161 (5.0%) [4.2–5.9%]	
	Number of respondents who received what they asked for	89 (2.8%) [2.2.–3.5]	High SES

* See previous article[15] for full description of hypotheses.
† Outcomes are presented as a percentage of the total population of respondents to allow a comparison of the various effects on a population.
SES, socioeconomic status.

knowledgeable patient or that the patient was failing to acknowledge the doctor's professional expertise. Independent variables were categorized to maximize opportunities to determine the effect of low SES.

Univariate relationships between independent variables and the dependent variables were calculated using the χ^2 statistic or Fisher exact test as appropriate. Multivariate relationships were analyzed using the same methods of stepwise multiple logistic regression and adjustment for weighting described in the previous article.[15]

Results

Characteristics of Respondents (n = 3209)

The characteristics of the respondents before and after weighting are presented in Table 2, which allows for an assessment of the demographic representativeness of our sample. The small differences between unweighted and weighted data suggest that the random-digit dialing method succeeded in generating a sample similar in profile to that of the US population.

Among the 308 respondents who had discussed information from DTCA with their physician, 82 were not asked about this because they had already responded to questions about taking information from the Internet to a visit (Figure 1). The 226 who did provide information were more likely to be unemployed (33% vs 20%, $P = .036$); less likely to be in good health (24% vs 43%, $P = .011$); and more likely to have a regular doctor (95% vs 82%, $P = .008$) than the 82 who did not provide information.

Overall Perceptions of DTCA

Most respondents were fairly positive about the recent increase in drug advertisements; 7% [95% confidence interval (CI) 6 to 8%] thought it was a very good thing and 40% (95% CI, 38 to 43%) thought it was a good thing. Thirty-four percent (95% CI, 31 to 36%) were neutral, and only 19% (95% CI, 18 to 21%) thought it was either very bad or bad. There was no association between socioeconomic status and overall opinion about DTCA. Table 3 presents the proportions of respondents who had seen a DTCA in the preceding 12 months who agreed with various statements about potential benefits and harms of DTCA.

Response to DTCA

Eighty-three percent (95% CI, 81 to 85%) of all respondents had seen an advertisement for a prescription medication in the preceding 12 months. The most common source of DTCA was television (94%), followed by newspapers or journals (62%) and the radio (22%). In the preceding 12 months, 20% (95% CI, 19 to 22%; n = 649) of respondents had seen a drug advertisement relevant to their health, and 10% (95% CI, 8 to 11%; n = 308) had discussed information in a drug advertisement with their doctors (Figure 1). Seventy-seven percent (n = 171) of these conversations were with a primary care physician.

Effects of DTCA

Table 1 summarizes our research questions, outcome variables, the number of respondents who stated they had experienced each outcome, and the significant associations with each outcome. Both in Table 1 and the text, the main outcomes are grouped into clinical benefits and harms, psychosocial benefits, effect on the doctor-patient relationship, and effect on health service utilization.

Clinical Benefits and Harms of DTCA

Requested Preventive Care

Of the 3209 respondents, 203 had requested preventive care, such as a screening or blood test. Socioeconomic status was strongly associated with this outcome; people who had not completed high school, Hispanics, and people with chronic disease were all more likely to seek preventive care as a result of information in a drug advertisement (Table 4).

Scheduled Checkup

Of the 3209 respondents, 189 had visited a health professional for a check-up as a result of information in a DTCA. The relationship between this outcome and socioeconomic status was very similar to that for requesting preventive care (data not shown).

Diagnosed with Condition Mentioned in Advertisement

Of the 226 people who discussed information from a drug advertisement with a doctor, 28 were told they either had, or were at risk for, the condition mentioned in the advertisement during or immediately after the visit during which DTCA was discussed. This outcome was not associated with

Table 2. Demographic and Health Characteristics of Respondents

Characteristic	Unweighted %	Unweighted n	Weighted* %	Weighted* n
Demographics				
Age				
18–24	9	275	15.5	489
25–34	18	567	18.5	583
35–44	23	726	22	700
45–54	20	642	18	573
55–64	12	384	11	353
65+	18	575	15	462
Gender				
Female	55	1757	48	1523
Male	45	1452	53	1686
Race				
White (non-Hispanic)	78	2477	71	2247
Black/African American (non-Hispanic)	10	319	12	390
Hispanic	8	249	11	342
Asian/Pacific Islanders (non-Hispanic)	2	58	4	116
Other (non-Hispanic)	3	82	3	90
Educational status				
Less than high school	4	114	5	161
Completed high school	59	1870	71	2274
Completed college	27	858	17	548
Advanced degree	11	354	7	211
Annual income				
<$35,000	47	1306	53	1481
$35,000–$74,999	34	962	32	904
$75,000–$124,999	13	366	11	309
>$125,000	6	176	4	120
Health status				
Good	62	1977	73	2333
Poor†	38	1224	27	871
Health care factors				
Health insurance status				
Insured	93	2957	85	2698
Not insured	7	236	15	474
In managed care?				
Yes	65	1889	66	1743
No	35	1008	34	886
% of Respondents who responded 'often' or 'sometimes' to the following statements:				
Doctors have excellent medical skills	95	2999	95	2989
Doctors are open to what patients say	83	2633	84	2648
Doctors are behind in their knowledge of research and the latest treatments.	74	2261	74	2259
Doctors spend enough time with their patients	69	2161	69	2191
Proactive approach to health information‡				
Yes	40	1268	35	1134
No	60	1932	65	2068
Have a regular doctor?				
Yes	85	2728	81	2596
No	15	477	19	612
Rating of level of care from regular doctor, or doctor seen most often?				
Excellent/very good	71	2058	69	1948
Good	21	620	22	612
Fair/poor	8	225	9	246
How often does regular doctor encourage you to look for information?				
Often/sometimes	38	1033	38	971
Hardly ever/never	62	1667	62	1599

* Data were weighted to adjust for unequal probability of selection (including the oversample of persons in poor health). To adjust for survey nonresponse, stratification weights were developed using the March 2000 Current Population Survey from the US Census Bureau as standard. The poststratification weights were based on gender within age within race, as well as education, health insurance status (insured vs. uninsured), and household size. This weighting procedure results in a sample that is representative of the US population.

† Poor health was defined as having a chronic disease or disability that prevented respondent from participating fully in school, work, housework, or other activities; having been hospitalized other than for a normal delivery within the past 12 months; and/or the respondent defining their health as fair or poor rather than excellent, very good, or good.

‡ See text for definition.

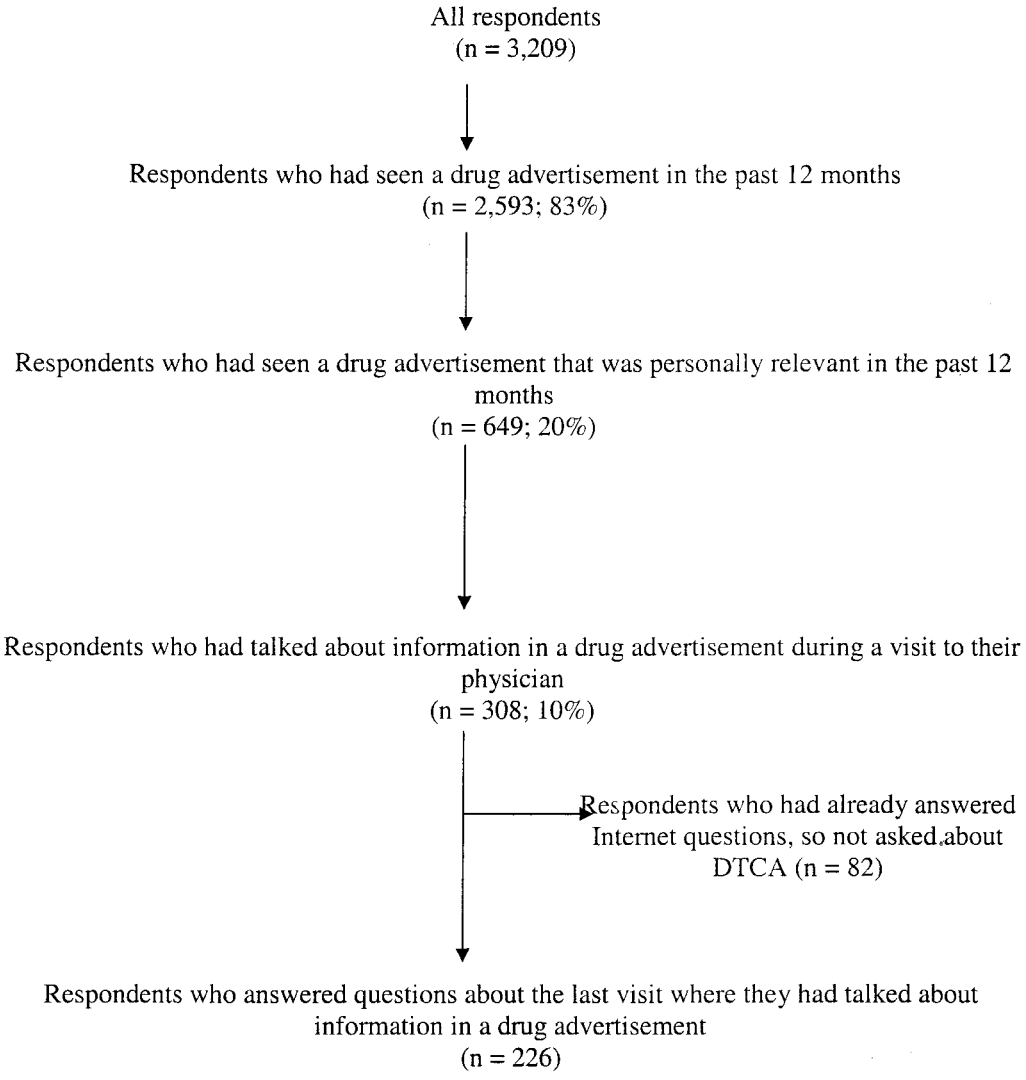

Figure 1. Flow chart of respondents.

socioeconomic status but was associated with being in managed care (2% in managed care vs 0% not in managed care; $P = .012$). A further 149 respondents had previously been diagnosed with the condition mentioned in the advertisement.

Improved Treatment

Of 226 respondents, 67 were given the medication mentioned in the drug advertisement and told by their doctors that it would improve their health. This outcome was more prevalent in people with low incomes (61% annual income <$15,000 vs 35% ≥$15,000, $P = .032$); low educational status (61% not completed high school vs 34% for high school graduate or higher, $P = .021$); and people who were not proactive about health information (45% not proactive vs 25% proactive, $P = .006$).

Table 3. Respondents' Views about Effects of DTCA (n = 2593)

Advertisements for prescription drugs:	% Agreeing
Give patients confidence to talk to their doctors about their concerns	88
Encourage people to follow treatment instructions or advice from their doctors	81
Drive up the cost of prescription drugs	76
Improve people's understanding of medical conditions and treatments	72
Help patients get treatments they wouldn't otherwise get	69
Promote unnecessary fear of the side effects	54
Promote unnecessary visits to doctors	48
Cause patients to take up more of their doctors' time	38
Interfere with good relationships between doctors and patients	30

Table 4. Factors Associated with Seeking Preventive Care Because of Information in a Drug Advertisement

	n	% Yes (Mostly or Partly)	*P*
Total	2590	8 (95% CI 7–9%)	
Socioeconomic variables			
Annual Income			0.150
Less than $15,000	357	9	
$15,000–$24,999	401	10	
$25,000–$49,999	808	7	
$50,000 or more	759	7	
Education			<0.001
Less than high school	242	16	
Completed high school	890	8	
Some college, no graduation	757	7	
College graduate or higher degree	691	7	
Race/Ethnicity			0.005
White, non-Hispanic	1947	7	
Black/African American, non-Hispanic	287	8	
Hispanic	186	15	
Asian, Pacific Islander, non-Hispanic	83	7	
Employment status			0.695
Not employed	183	10	
Employed part-time	258	8	
Employed full-time	1276	8	
Self-employed	202	7	
Other	661	7	
Health Status			<0.001
Poor health	181	5	
Good health	1156	5	
Chronic disease	1252	11	
Insurance status			0.489
Insured through work or privately	2049	8	
Medicare	117	9	
Medicaid	63	10	
Not insured	331	6	
Managed care?			0.221
Yes	1479	9	
No	708	7	
Gender			0.747
Male	1210	8	
Female	1381	8	
Age			<0.001
18–24	383	7	
25–44	1052	7	
45–64	775	12	
65+	352	6	
Attitudes to health information			
Proactive about health information?			<0.001
Yes	972	10	
No	1615	6	
Relationship with health care professionals			
Do you have a regular doctor or health care professional?			0.715
Yes	2139	8	
No	450	8	
How do you rate the overall level of health care provided by your regular doctor?			<0.001
Excellent/very good/good	2127	7	
Fair/poor	187	14	

Worsened Treatment

Twenty-six people reported requesting and receiving an advertised medication that their doctor said would not help them. This was more likely to occur for persons aged 18 to 24 than for those over 25 (75% vs 9%, $P < .001$).

Psychosocial Benefits of DTCA

Enhanced Sense of Control during Visit

Of 226 people, 168 said that they had felt more in control during a visit to a doctor as a result of information in a DTCA. Women were more likely than men to experience this enhanced sense of

control (85% vs 68%, $P = .003$), as were people who were not proactive about health information compared with those who were (83% vs 72%, $P = .041$).

Enhanced Sense of Confidence during Visit

Of 226 people, 142 said they had felt more confident during the visit as a result of information in a drug advertisement. This was not related to respondents' socioeconomic status.

Effects of DTCA on Doctor-Patient Relationship

Disclosed Health Concerns to Doctor

Of 3209 people, 455 stated they had talked about concerns about their own health to a doctor as a result of information in a DTCA. This outcome was associated with low socioeconomic status (Table 5).

Changed Global Rating of Doctor-Patient Relationship

Of the 226 people who provided information about discussing DTCA during a visit, 51 thought the relationship had improved as a result, 163 thought there had been no change, and 11 thought it had worsened. This outcome was strongly related to socioeconomic status. Respondents who made a request but did not get what they asked for were more likely to report a worsened doctor-patient relationship (Table 6).

Doctor Acted Challenged

Of the 226 people, 30 reported that their doctors had acted as if they felt their authority was being challenged by the patient's discussing information from a drug advertisement during a visit. Respondents were more likely to perceive their doctor as acting challenged if they were of low educational status (33% not completed high school vs 12% graduated from high school, $P = .010$) and if they were proactive about health information (18% proactive vs 9% not proactive, $P = .046$).

Patient Manifested Serious Dissatisfaction after Discussing DTCA during a Visit

Of 226 people, 46 sought a second opinion (n = 29), changed their doctor (n = 19), or changed their health care plans (n = 11) as a result of dissatisfaction with a discussion with their doctor about DTCA during a visit. This was more prevalent in people of low socioeconomic status but was not related to getting or not getting a specific intervention requested (Table 7).

Effects of DTCA on Health Care System

Scheduled a Visit to a Physician to Discuss Information in DTCA

Most respondents waited to discuss information until they had some other reason for visiting their doctors; however, 55 of 226 respondents scheduled a visit to a physician specifically (n = 27) or partly (n = 28) to discuss information from an advertisement. This outcome was related to socioeconomic status, with people of low education (58% not completed high school vs 22% completed high school, $P = .009$) and people in managed care (27% in managed care vs 13% not in managed care, $P = .021$) more likely to do so.

Requests Made and Filled

One hundred and sixty-one people requested at least one intervention from their doctors as a result of DTCA. Most requests were for changes in medication (n = 131), followed by tests (n = 69) and referrals to a specialist (n = 50). Of these people, 89 received the specific intervention requested. Receiving the specific intervention requested was associated with higher socioeconomic status. Respondents were more likely to get what they asked for if they were white (whites 63% vs nonwhites 30%, $P = .001$) or had completed high school (58% completed high school vs 29% not completed, $P = .033$). There was no association with being in managed care and having requests filled.

Discussion

Implications

We found significant positive and negative effects of DTCA on health behaviors, health service utilization, and the doctor-patient relationship. The impact was greatest on people of low socioeconomic status. This information is important to those seeking to maximize the benefits and minimize the harms of DTCA.

DTCA encourages members of the public, particularly those of low socioeconomic status, who are traditionally considered hard to reach with public health campaigns,[11,12] to request preventive care and schedule a checkup. It encourages people to disclose health concerns to their doctor, and en-

Table 5. Factors Associated with Disclosing Health Concerns to a Doctor Because of DTCA

	n	% Yes (Mostly or partly)	*P*
Total	2589	18 (95% CI 16–19%)	
Socioeconomic variables			
Annual Income			<0.001
Less than $15,000	356	20	
$15,000–$24,999	402	25	
$25,000–$49,999	809	18	
$50,000 or more	759	14	
Education			0.022
Less than high school	240	22	
Completed high school	891	20	
Some college, no graduation	757	16	
College graduate or higher degree	690	15	
Race/Ethnicity			0.007
White, non-Hispanic	1945	17	
Black/African-American, non-Hispanic	288	24	
Hispanic	186	21	
Asian, Pacific Islander, non-Hispanic	83	21	
Employment status			0.066
Not employed	181	12	
Employed part-time	259	22	
Employed full-time	1279	17	
Self-employed	201	16	
Other	658	19	
Health Status			<0.001
Poor health	182	14	
Good health	1157	13	
Chronic disease	1250	22	
Insurance status			0.281
Insured through work or privately	2050	17	
Medicare	115	24	
Medicaid	64	16	
Not insured	332	16	
Managed care			0.226
Yes	1479	18	
No	706	16	
Gender			0.415
Male	1210	18	
Female	1379	17	
Age			0.046
18–24	383	19	
25–44	1053	15	
45–64	775	20	
65+	349	18	
Attitudes to health information			
Proactive about health information?			<0.001
Yes	970	22	
No	1615	15	
Relationship with health care professionals			
Do you have a regular doctor or health care professional?			0.483
Yes	2137	18	
No	450	16	
How do you rate the overall level of health care provided by your regular doctor?			0.003
Excellent/very good/good	2125	18	
Fair/poor	187	27	

hances some patients' sense of confidence and control during a visit. From a policy or population health perspective, these undoubted benefits have to be weighed against the well-documented effect of DTCA on increasing health costs. In our previous article, we demonstrated that physicians experience DTCA as having an adverse effect on time efficiency and resulting in numerous, clinically inappropriate requests for tests, specialist referrals, and changes in medication. About half such re-

Table 6. Factors Associated with Changes in the Doctor-Patient Relationship

	n	% Improved	% Neutral	% Worsened	*P*
Total (95% CI)	225	23 (17% to 29%)	73 (65–79%)	5 (2–13%)	
Socioeconomic variables					
Annual Income					<0.001
Less than $15,000	23	22	44	35	
$15,000–$24,999	42	14	86	0	
$25,000–$49,999	63	22	75	3	
$50,000 or more	73	21	78	1	
Education					<0.001
Less than high school	19	26	42	32	
Completed high school	73	29	69	3	
Some college, no graduation	60	15	83	2	
College graduate or higher degree	71	21	78	1	
Race/Ethnicity					<0.001
White, non-Hispanic	169	22	77	2	
Black, non-Hispanic	33	21	61	18	
Hispanic	11	27	73	0	
Asian, non-Hispanic	2	100	0	0	
Employment status					<0.001
Not employed	15	33	27	40	
Employed part-time	30	10	87	3	
Employed full-time	101	26	73	1	
Self-employed	16	13	82	6	
Other	58	24	74	2	
Health Status					0.254
Poor health	16	25	75	0	
Good health	55	24	76	0	
Chronic disease	154	22	71	7	
Insurance status					<0.001
Insured through work or privately	154	21	76	3	
Medicare	33	27	67	6	
Medicaid	24	25	75	0	
Not insured	13	15	46	39	
Managed care?					0.726
Yes	143	23	73	4	
No	65	25	74	2	
Gender					0.011
Male	98	31	67	2	
Female	127	16	7	77	
Age					0.011
18–24	16	31	63	6	
25–44	82	11	81	9	
45–64	86	34	64	2	
65+	39	18	80	3	
Attitudes to health information					
Proactive about health information?					0.014
Yes	104	19	80	1	
No	121	26	66	8	
Relationship with health care professionals					
Do you have a regular doctor or health care professional?					0.447
Yes	212	23	72	5	
No	12	8	83	8	
How do you rate the overall level of health care provided by your regular doctor?					0.001
Excellent/very good/good	200	24	75	2	
Fair/poor	23	17	52	30	
Did you get specific intervention requested?					0.029
Yes	89	27	73	0	
No	70	20	73	7	

quests are acquiesced to, with negative consequences on health care expenditure without commensurate health benefits. When considering the overall benefits and harms of DTCA, could the $2.5 billion spent on DTCA last year have achieved equivalent health benefits if the techniques of ad-

Table 7. Factors Associated with Manifestations of Serious Dissatisfaction (ie, Seeking Second Opinion, Changing Doctor, or Changing Health Plan)

	n	% Yes	*P*
Total	225	21 (95% CI 14–29%)	
Socioeconomic variables			
Annual Income			<0.001
Less than $15,000	22	55	
$15,000–$24,999	43	30	
$25,000–$49,999	64	14	
$50,000 or more	73	11	
Education			<0.001
Less than high school	20	55	
Completed high school	75	23	
Some college, no graduation	60	13	
College graduate or higher degree	71	14	
Race/Ethnicity			0.031
White, non-Hispanic	170	19	
Black/African-American, non-Hispanic	34	27	
Hispanic	12	17	
Asian, Pacific Islander, non-Hispanic	2	100	
Employment status			<0.001
Not employed	15	53	
Employed part-time	30	27	
Employed full-time	103	8	
Self-employed	17	41	
Other	57	26	
Health Status			0.322
Poor health	16	31	
Good health	54	15	
Chronic disease	155	21	
Insurance status			<0.001
Insured through work or privately	155	14	
Medicare	34	18	
Medicaid	24	33	
Not insured	13	85	
Managed care?			0.800
Yes	143	17	
No	65	15	
Gender			0.231
Male	98	25	
Female	128	18	
Age			<0.001
18–24	16	69	
25–44	82	16	
45–64	86	13	
65+	40	28	
Attitudes to health information			
Proactive about health information?			0.202
Yes	103	24	
No	121	17	
Relationship with health care professionals			
Do you have a regular doctor or health care professional?			0.255
Yes	213	20	
No	12	33	
How do you rate the overall level of health care provided by your regular doctor?			<0.001
Excellent/very good/good	200	17	
Fair/poor	23	52	
Did you get specific intervention requested?			0.277
Yes	89	18	
No	71	26	

vertising were focused on interventions that are known to improve health outcomes?

Although only 5% of respondents who brought DTCA information to their doctors reported a negative impact on the doctor-patient relationship, 13% perceived that their doctor felt his/her authority had been challenged, and 21% reported sufficient dissatisfaction that they sought a second opinion, a change in doctor, or a change in health care plan. These data could represent the positive outcome of an informed health consumer or the negative outcome of information provided by a biased third party that undermines the consumer's confidence in the health system. More research is needed to answer this question.

Methodological Issues

Several methodological issues limit the generalizability of our findings. First, this article reports on a secondary analysis of an extant data set, so not all hypotheses could be evaluated with the desired precision. In addition, lack of information from respondents' physicians and/or medical records precludes direct verification of respondents' perceptions. For example, we cannot determine whether requests made and filled were clinically indicated. Finally, respondents who discussed health information from the Internet with their physicians were not asked about the last time they took information from DTCA to a physician visit; hence, generalizability is restricted to the population that does not take information from the Internet to their doctor. However, these data are important because the 226 respondents who provided information about taking DTCA to a physician visit were of lower socioeconomic status than the 82 who did not. Other data from responses by all 3209 respondents indicate that DTCA has greatest effect on people of low socioeconomic status. To accommodate for this limitation, we conservatively assumed that the subsample that was not asked about discussing DTCA during a physician visit experienced no effects (ie, would not have sought an appointment or made a request). Thus, all our estimates of the population effects of DTCA are minimum estimates.

Conclusions

DTCA has positive and negative effects on health behaviors, health service utilization, and the doctor-patient relationship that are greatest on people of low socioeconomic status. The benefits of DTCA in terms of encouraging hard-to-reach sections of the population to attend for preventive care must be balanced against the increased costs to the health service from clinically inappropriate requests generated by DTCA.

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