ORIGINAL RESEARCH

Pharmaceutical Industry Gifts to Physicians: Patient Beliefs and Trust in Physicians and the Health Care System

David Grande, MD, MPA[1,2], Judy A. Shea, PhD[1,2], and Katrina Armstrong, MD, MSCE[1,2,3]

[1]Department of Medicine, University of Pennsylvania, Philadelphia, PA, USA; [2]Leonard Davis Institute of Health Economics, University of Pennsylvania, Philadelphia, USA; [3]Abramson Cancer Center, University of Pennsylvania, Philadelphia, USA.

BACKGROUND: Pharmaceutical industry gifts to physicians are common and influence physician behavior. Little is known about patient beliefs about the prevalence of these gifts and how these beliefs may influence trust in physicians and the health care system.

OBJECTIVE: To measure patient perceptions about the prevalence of industry gifts and their relationship to trust in doctors and the health care system.

DESIGN: Cross sectional random digit dial telephone survey.

PARTICIPANTS: African-American and White adults in 40 large metropolitan areas.

MAIN MEASURES: Respondents' beliefs about whether their physician and physicians in general receive industry gifts, physician trust, and health care system distrust.

KEY RESULTS: Overall, 55% of respondents believe their physician receives gifts, and 34% believe almost all doctors receive gifts. Respondents of higher socioeconomic status (income, education) and younger age were more likely to believe their physician receives gifts. In multivariate analyses, those that believe their personal physician receives gifts were more likely to report low physician trust (OR 2.26, 95% CI 1.56–3.30) and high health care system distrust (OR 2.03, 95% CI 1.49–2.77). Similarly, those that believe almost all doctors accept gifts were more likely to report low physician trust (OR 1.69, 95% CI 1.25–2.29) and high health care system distrust (OR 2.57, 95% CI 1.82–3.62).

CONCLUSIONS: Patients perceive physician–industry gift relationships as common. Patients that believe gift relationships exist report lower levels of physician trust and higher rates of health care system distrust. Greater efforts to limit industry–physician gifts could have positive effects beyond reducing influences on physician behavior.

Received February 17, 2010
Revised May 3, 2011
Accepted May 25, 2011
Published online June 14 2011

KEY WORDS: pharmaceutical marketing; conflicts of interest; trust; medical professionalism.
J Gen Intern Med 27(3):274–9
DOI: 10.1007/s11606-011-1760-3

INTRODUCTION

Pharmaceutical industry gifts to physicians are common—recent evidence suggests that more than 7 in 10 physicians receive gifts from industry[1]. These relationships have raised two primary concerns. First, industry relationships can unduly influence physician decision-making, thereby undermining patient-centered care. Indeed, research has confirmed the legitimacy of this concern[2–6]. Second, patient perceptions of a conflict of interest could undermine trust in their physician as well as the health care system more generally[7–9].

Trust has long been recognized as an essential element of the therapeutic relationship between patients and their physicians[10–14]. Trust is particularly important in the context of vulnerability, complex information, and uncertainty[15,16]. Distrust can be more than the absence of trust but rather active wariness or pessimism[13]. In health care, patients naturally are reliant on professionals for their clinical expertise and emotional support in making health care decisions. Low physician trust is associated with decreased patient satisfaction and lower adherence to treatment and screening recommendations[17–20]. Moreover, low trust and distrust in the health care system are associated with worse health status[21,22]. Thus, sustaining and improving trust is an important goal for the medical profession and the health care system. Trust has multiple dimensions among which fidelity, the principal of putting patients' interests above all others, is a key component[13]. Pharmaceutical gifts may undermine fidelity through perceived or real influence on physician practice.

Despite widespread attention to pharmaceutical marketing and speculation that it undermines trust in physicians, few studies have examined patient perceptions about the prevalence of physician–industry relationships and how perceptions may shape trust in physicians and the health care system. A study of patients at two hospitals (one military, one civilian) found that 54% of patients were aware that physicians receive industry gifts and 27% thought their own doctor accepted gifts[23]. A survey of patients in

Kentucky found that just 32% were aware that physicians receive personal gifts[24]. However, these studies were published in the 1990s, prior to the surge in public and professional attention to pharmaceutical marketing and conflicts of interest.

This study aims to measure patient perceptions about the prevalence of physician–industry relationships, how perceptions vary across demographic groups, and whether these perceptions are associated with lower levels of trust in physicians and higher levels of distrust in the overall health care system. Our approach is a survey of patients in large metropolitan areas in the United States.

METHODS

We conducted a random digit dial telephone survey of African American and White non-Latino adults in 40 metropolitan areas (Metropolitan Statistical Areas – MSAs). The study was approved by the University of Pennsylvania Institutional Review Board. As part of a larger study examining racial differences in health care system distrust, we sampled the 40 largest MSAs with at least 5% African-Americans in the population. With these criteria, 31 of the MSAs were east of the Mississippi and the remainder to the West. The sampling strategy was based on a larger study designed to examine differences in distrust between African-Americans and Whites within and across large metropolitan areas in the U.S. Sampling was limited to these two racial groups due to the historical importance of race and trust in the U.S. health care system. Due to Hurricane Katrina, the New Orleans, LA MSA was replaced with the Pittsburgh, PA MSA during the data collection period. Pittsburgh was selected because it was the next largest city with at least 5% African-Americans in the population among the largest MSAs in the U.S. A random sample of land-line telephone numbers from each MSA was selected for the survey. In MSAs with a greater percentage of African-Americans, fewer telephone numbers were sampled to achieve our recruitment goal. The objective was to complete interviews on 30 African American and 30 White respondents in each MSA. Business numbers were removed by matching against a Yellow Pages database. Nonworking numbers were removed through an automated dialing procedure that detects nonworking numbers. We oversampled African Americans within each MSA.

Study Variables

Pharmaceutical Industry Gifts to Physicians. Respondents were asked about their perceptions of the prevalence of pharmaceutical industry–physician gift relationships. We focused on "small" gifts because they are the most common[1,25] and provided in the office setting and thus most likely to be observed by patients. First, they were asked about physicians in general with the following question: "Doctors may be offered gifts such as dinners at restaurants, office lunches, and examination room supplies from companies that make prescription drugs. Thinking about your own personal experiences as well as the experiences of people you know, would you say that…" Response options included "almost no doctors accept gifts," "some doctors accept gifts," and "almost all doctors accept gifts." Second, they were asked about their personal physician with the following question: "Thinking again about your personal doctor or the doctor you have seen most in the last three years, do you think the doctor accepts gifts such as…" Respondents could choose either "yes" or "no."

Health Care System Distrust and Physician Trust. Health care system distrust was assessed using a 9 item established scale, the Health Care System Distrust Scale (Cronbach's alpha 0.83)[26]. Physician trust was assessed using seven items from the Primary Care Assessment Survey (Cronbach's alpha 0.86)[27]. In addition to these two measures of health care related trust, we also measured social trust using a three-item instrument from the General Social Survey[28].

Health and Socio-demographic Characteristics. Measures of socio-demographic characteristics were assessed with items from the National Health Interview survey and included race, ethnicity, income, and educational attainment. Because of an administrative error, exact age was not collected in the survey. For 59% of the sample, age was able to be determined from publicly available data using the name and address of the respondent. For the rest of the sample, age was derived from the census tract adult age distribution for the race and gender of the respondent. We also included measures of health status and health access including the presence of a chronic health condition(s) and health insurance coverage. These variables were included in our analysis because we hypothesized that differences in health status and access change the nature and frequency of interactions with the health care system.

Survey Administration

The survey was administered from June 3, 2006 to December 21, 2006 using a computer assisted telephone interview. Each household was screened for eligibility through an initial question that asked if the household was "mostly…" Hispanic or Latino followed by the same question about race. Households that selected "Black or African American" or "White" were included in this study. The interviewer randomly selected a survey participant from a household roster provided by the answering party using an established algorithm. The race and ethnicity of the respondent was collected with two additional questions. A total of 2,179 individuals responded to the survey from the 40 MSAs including 2,029 African American or White respondents. The interview completion rate was 64.5% among eligible respondents. The screener completion rate (i.e. number of household in which race and age eligibility was determined) was 35.1%. The overall response rate was 31.1% (calculated using the AAPOR response rate #4)[29]. Respondents were compensated $25 for their participation.

Statistical Analysis

We examined the association of respondent health and demographic characteristics with perceptions about the prevalence of gift relationships between the pharmaceutical industry and physicians. Chi-square statistics were used to test for bivariate associations and logistical regression was used to test for independent associations. We examined the association of health care system distrust and physician trust with perceptions about the prevalence of pharmaceutical industry–physician gifts. The dependent variables in these analyses were health care distrust

and physician trust. For health care distrust, the top quartile (i.e. high distrust) was compared to the bottom three quartiles. For physician trust, the bottom quartile (i.e. low trust) was compared to the top three quartiles. Chi-square statistics were used to test for bivariate associations. Logistical and multinomial logistical regressions were used to test for independent associations.

Sampling weights were used in the analyses to account for the complex sampling design. The sampling weights represent the inverse probability of inclusion in the sample adjusted for non-response bias based upon the estimated proportion of eligible household among the unresolved numbers. In addition, clustered standard errors were used in our multivariate analyses to account for the clustered (i.e. at the MSA level) sampling design. All P-values computed were two-sided. All analyses were performed using the Stata software program, version 9.2 (StataCorpLP; College Station, Texas).

RESULTS

The characteristics of survey respondents are shown in Table 1.

Beliefs about the Prevalence of Pharmaceutical Industry–Physician Gift Relationships

In a weighted analysis, 55% of respondents believed their personal physician accepts gifts from the pharmaceutical industry and 34% believed that almost all doctors accept pharmaceutical industry gifts (Table 2). 41% believed that some doctors accept gifts and 23% believed that almost no doctors accept gifts.

Table 1. Participant Characteristics (N=2,029)

	No. of Respondents	Unweighted Percentage	Weighted Percentage
Race			
African-American	762	37.6%	17.9%
White	1297	62.4%	82.1%
Income			
<$20,000	387	19.1%	15.7%
$20–40,000	441	21.7%	19.5%
$40–60,000	392	19.3%	18.8%
$60–100,000	400	19.7%	22.2%
>$100,000	244	12.0%	14.3%
Unknown	165	8.1%	9.6%
Education			
Up to HS Diploma	788	38.8%	36.4%
Some College but less than 4 Yr Degree	596	29.4%	28.2%
4 Yr College Degree or Graduate School	640	31.5%	35.3%
Sex			
Male	714	35.2%	36.8%
Female	1315	64.8%	63.2%
Age			
18–39	177	8.7%	8.4%
40–64	1317	64.9%	62.2%
>=65	535	26.4%	29.4%
Health Insurance			
Insured	1796	88.5%	89.5%
Uninsured	233	11.5%	10.5%
Chronic Diseases			
None	769	37.9%	39.8%
One	645	31.8%	30.5%
More than one	615	30.3%	29.8%

Table 2 shows how respondents' beliefs about physicians receiving pharmaceutical industry gifts vary by demographic and health characteristics. African Americans were less likely than Whites to believe their personal physician accepts gifts (48% vs. 57%, p=0.01) or that almost all doctors accept gifts (28% vs. 36%, p=0.04). Higher income and highly educated respondents were more likely to believe physicians in general receive gifts. For example, just 20% of respondents earning less than $20,000 per year believe that almost all doctors accept gifts compared to 56% of those earning more than $100,000 (p<0.001). Similarly, those with a 4 year college degree were almost twice as likely as those with a high school diploma or less to believe that almost all doctors accept gifts (41% vs. 22%, p<0.001). Older respondents were less likely than younger respondents to believe that almost all physicians accept gifts (>65: 28%, 40–64: 37%, 18–39: 39%; p=0.002).

After adjusting for income, education, sex, age, insurance status, and presence of a chronic condition, the relationship between race and beliefs about industry gifts were no longer significant (Table 3). The associations for education, income, and age remained significant.

Physician Trust and Health Care Distrust and Beliefs about Pharmaceutical Industry Gifts

Table 4 shows associations between patient beliefs about pharmaceutical industry gifts and physician trust and health care system distrust. Those that believed their personal physician accepts industry gifts were nearly twice as likely to report low trust in their physician (30% vs. 16%, p<0.001). This association held after adjustment for all moderators (OR 2.26, 95% CI 1.56–3.30), (Table 4). In unadjusted analyses, beliefs about whether physicians in general accept gifts were not associated with low physician trust (p=0.17). However, after adjustment for demographic and health characteristics, participants who believed almost all doctors accept gifts were more likely to report low physician trust (OR 1.69, 95% CI 1.25–2.29). Linear regression with physician trust as a continuous measure yielded similar results.

Those who believed their personal physician accepts pharmaceutical industry gifts were more likely to report high health care system distrust (top quartile) (29% vs. 15%, p<0.001). This association also held after adjustment for income, sex, age, insurance status, presence of a chronic condition, and social trust, (OR 2.03 95% CI 1.49–2.77). Similarly, those who believed physicians generally accept gifts were more likely to report high health care system distrust (31% almost all doctors accept gifts, 19% some doctors accept gifts , 16% almost no doctors accept gifts p<0.001). In adjusted analysis, those who believed that almost all doctors accept gifts were more likely to report high health care system distrust compared to those that believed almost no doctors accept gifts (OR 2.57 95% CI 1.82–3.62). Similar results were found with linear regression models treating health care distrust as a continuous measure.

DISCUSSION

Our study has three main findings. First, a majority (55%) of patients believe that their own physician accepts pharmaceu-

Table 2. Patient Perceptions of Physician Receipt of Gifts*

	"Thinking about…your personal doctor…do you think the doctor accepts gifts…?"		"…Thinking about your own personal experiences as well as the experiences of people who know, would you say that (X) accept gifts?"			
	Yes	P Value	Almost No Doctors	Some Doctors	Almost All Doctors	P value
Overall	55.2%		23.2%	42.2%	34.6%	
Race		0.01				0.04
African-American	48.4%		27.1%	44.6%	28.3%	
White	56.7%		22.3%	41.7%	36.0%	
Income		0.005				<0.001
<$20,000	41.6%		38.7%	41.6%	19.7%	
$20–40,000	52.8%		28.7%	41.4%	29.9%	
$40–60,000	59.1%		19.1%	40.2%	40.8%	
$60–100,000	61.8%		13.3%	50.1%	36.7%	
>$100,000	61.6%		9.5%	34.1%	56.4%	
Education		0.002				<0.001
Up to HS Diploma	46.1%		34.0%	44.2%	21.9%	
Some College but less than 4 Yr Degree	58.0%		17.5%	39.9%	42.5%	
4 Yr College Degree or Graduate School	62.0%		16.7%	41.9%	41.4%	
Sex		0.03				0.15
Male	58.5%		19.5%	42.6%	38.0%	
Female	53.2%		25.4%	42.0%	32.7%	
Age		0.002				0.002
18–39	54.7%		12.7%	48.4%	38.9%	
40–64	60.1%		20.5%	42.3%	37.2%	
>=65	44.0%		31.8%	40.2%	28.0%	
Health Insurance		0.66				0.23
Insured	55.0%		30.3%	37.4%	32.3%	
Uninsured	57.0%		22.4%	42.8%	34.9%	
Chronic Diseases		0.36				0.11
None	56.6%		21.0%	44.8%	34.4%	
One	57.6%		21.2%	42.8%	36.0%	
More than one	50.8%		28.3%	38.1%	33.6%	

*Weighted analysis

tical industry gifts. This compares to 27% in a 1998 study of patients at two hospitals (one military, one civilian)[23]. In our study, 75% believed that at least some physicians receive gifts compared to 54% in the 1998 study[23]. Although the studies are drawn from different populations, the marked difference suggests growing awareness or frequency of industry–physician gift relationships. A large national survey of physicians administered 2 years prior to our survey found that 83% received direct gifts from pharmaceutical companies[25]. Thus, we might have expected an even higher perceived prevalence than we observed in our study. In addition, if 83% of doctors receive gifts, it is likely that a significant percentage of patients are not aware that their personal physician receives industry gifts. However, the patients in our study were not sampled in a way that would make them "representative" of U.S. physicians and drawing further conclusions is difficult.

Second, a belief that physicians have gift relationships with the pharmaceutical industry is held across demographic groups. However, these beliefs are more common among patients with a college education and those earning more than $40,000 a year. Whether this association is attributable to high SES patients being cared for in settings with a higher prevalence of industry gifts or reflects differential awareness cannot be illuminated from our data. Race and age were much less important contributors while sex, measures of health (i.e. presence of a chronic health condition) and health care access (i.e. insurance status) were not associated.

Third, patients that believe physicians accept pharmaceutical industry gifts are significantly more likely to report low trust in their physician and higher levels of health care system distrust. The association of low physician trust and high health care distrust with a belief that physicians receive pharmaceutical industry gifts is a new finding. Although many have argued that physician–industry marketing relationships could undermine trust and conceptual models of trust would predict this association, we are not aware of any studies that have demonstrated an association. While a cross-sectional study is not able to demonstrate a causal relationship, it provides supporting evidence of the view that the perception of a conflict of interest may be important. An alternative interpretation of our findings is that individuals that are less trusting are more likely to believe their doctors take gifts regardless of whether they actually do take gifts. Our study design does not permit us to exclude this possibility. When we controlled for social trust of the respondent, we had similar findings suggesting that the association is not simply due to a predisposition to be less trusting. Thus, whether or not a particular marketing activity negatively influences physician prescribing may be irrelevant if there is an underlying negative effect on trust given its important role in the doctor–patient relationship and health care[11,13,16].

Our study has several limitations. First, we were not able to collect data from the respondents' physicians to know if

Table 3. Predictors of Patient Perceptions of Physician Receipt of Gifts

	"Thinking about… your personal doctor…do you think the doctor accepts gifts…?"		"…Thinking about your own personal experiences as well as the experiences of people who know, would you say that (X) accept gifts?"			
	Yes (OR)	P Value	Some Doctors (RR)*	P Value	Almost All Doctors (RR)*	P Value
Race						
White	ref		ref		ref	
African-American	0.74	0.08	0.94	0.78	0.80	0.25
Income						
<$20,000	ref		ref		ref	
$20–40,000	1.40	0.28	1.27	0.42	1.81	0.04
$40–60,000	1.61	0.12	1.54	0.05	2.91	<0.001
$60–100,000	1.58	0.23	2.66	0.004	3.49	0.008
>$100,000	1.41	0.25	2.38	0.09	7.11	0.001
Education						
Up to HS Diploma	ref		ref		ref	
Some College but less than 4 Yr Degree	1.28	0.43	1.38	0.02	2.69	<0.001
4 Yr College Degree or Graduate School	1.43	0.19	1.13	0.47	1.88	<0.001
Sex						
Male	ref		ref		ref	
Female	0.98	0.86	0.85	0.49	0.85	0.54
Age						
18–39	ref		ref		ref	
40–64	1.46	0.31	0.62	0.24	0.65	0.18
>=65	0.81	0.60	0.46	0.09	0.44	0.05
Health Insurance						
Uninsured	ref		ref		ref	
Insured	0.90	0.69	1.40	0.31	0.93	0.47
Chronic Diseases						
None	ref		ref		ref	
One	1.11	0.62	1.06	0.82	1.18	0.58
More than one	0.98	0.89	0.82	0.25	1.14	0.50

* Reference group: Almost no doctors accept gifts

their physician in fact accepts gifts. However, our study was focused on patient perceptions as opposed to physician behavior. Second, we had a relatively low response rate to our survey. Non-responders may differ from responders However, the number of calls it took to complete a survey was not associated with differences in distrust, increasing confidence in our findings. Third, our study is not representative of the U.S. population at-large. Our sampling strategy allows us to generalize to African-Americans and Whites living in large metropolitan areas in the U.S. Approximately 40% of the U.S. population lives in the metropolitan areas represented in our study.

Table 4. Beliefs about Pharmaceutical Industry Gifts to Physicians and Trust

	Low Trust in Personal Physician (OR)	P Value	High Health Care System Distrust (OR)	P Value
Beliefs about Personal Physician and Industry Gifts				
Does not accept gifts	ref		ref	
Accepts gifts	2.26	<0.001	2.03	<0.001
Beliefs about Physicians and Industry Gifts				
Almost no doctors accept gifts	ref			
Some doctors accept gifts	1.08	0.76	1.34	0.06
Almost all doctors accept gifts	1.69	0.001	2.57	<0.001

*Covariates: age, sex, income, education, race, insurance status, chronic conditions, social trust

Despite significant professional and policy attention, physician–industry gift relationships remain very common and patient awareness of these relationships is relatively high across diverse populations. Prior studies have demonstrated that these relationships unduly influence physician practice[2–6]. Our study demonstrates that perceived relationships are associated with decreased trust in doctors and the health care system. The combined effect could be particularly detrimental to health care and warrants greater attention by the medical profession. One potential implication of our findings is that physicians should recognize how gift relationships could negatively impact the doctor–patient relationship regardless of whether a physician believes they are influenced by these relationships. From a professional standpoint, medical societies encouraging their members to end gift relationships may find that physicians are more easily swayed by this argument. The idea that perception is reality could be a powerful message. Finally, further research is needed to understand how actual physician marketing relationships influence patient perceptions and trust. Clarifying this relationship will help determine if and how changes

in individual physician behavior might promote higher levels of trust.

Funding: *This research was supported by the National Human Genome Research Institute (R01 HG 2689–01) and the American Cancer Society (Research Scholar Award PBP-104351). David Grande receives support from the HealthWell Foundation.*

Prior Presentations: *Presented in part at the Society of General Internal Medicine Annual Meeting, May 14, 2009, Miami, FL.*

Conflicts of Interest: *Dr. Grande reports serving as an expert witness on behalf of the Attorney General of the State of Vermont in a case concerning pharmaceutical marketing. Dr. Grande served a term ending March 2011 as a voluntary member of the Board of Directors of the National Physicians Alliance.*

Corresponding Author: *David Grande, MD, MPA; Department of Medicine, University of Pennsylvania, 3641 Locust Walk – Room 407, Philadelphia, PA 19104, USA (e-mail: dgrande@wharton.upenn.edu).*

REFERENCES

1. **Campbell EG, Rao SR, DesRoches CM, et al.** Physician Professionalism and Changes in Physician–Industry Relationships From 2004 to 2009. Arch Intern Med. 170:1820–6.
2. **Wazana A.** Physicians and the pharmaceutical industry—Is a gift ever just a gift? JAMA. 2000;283:373–80.
3. **Lexchin J.** Interactions between physicians and the pharmaceutical industry: what does the literature say? CMAJ. 1993;149:1401–7.
4. **Blumenthal D.** Doctors and Drug Companies. New Engl J Med. 2004;351:1885–90.
5. **Brennan TA, Rothman DJ, Blank L, et al.** Health industry practices that create conflicts of interest: A policy proposal for academic medical centers. JAMA. 2006;295:429–33.
6. **Cain DM, Detsky AS.** Everyone's a little bit biased (even physicians). JAMA. 2008;299:2893–5.
7. **Brennan TA, Mello MM.** Sunshine laws and the pharmaceutical industry. JAMA. 2007;297:1255–7.
8. Association of American Medical Colleges. Industry funding of medical education report of an AAMC task force. Washington, DC; 2008.
9. **Coyle SL**, For the Ethics and Human Rights Committee ACP-ASIM. Physician–industry relations. Part 1: individual physicians. Ann Intern Med. 2002;136:396–402.
10. **Pearson SD, Raeke LH.** Patients' trust in physicians: many theories, few measures, and little data. J Gen Intern Med. 2000;15:509–13.
11. **Mechanic D.** The functions and limitations of trust in the provision of medical care. J Health Polit Pol Law. 1998;23:661–87.
12. **Mechanic D, Meyer S.** Concepts of trust among patients with serious illness. Soc Sci Med. 2000;51:657–68.
13. **Hall MA, Dugan E, Zheng B, Mishra AK.** Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? Milbank Q. 2001;79:613–39.
14. **Mechanic D.** Changing medical organization and the erosion of trust. Milbank Q. 1996;74:171–89.
15. **Goold S.** Money and trust: relationships between patients, physicians and health plans. J Health Polit Pol Law. 1998;23:688–95.
16. **Hall MA.** Arrow on Trust. J Health Polit Pol Law. 2001; 26:1131.
17. **Safran DG, Taira DA, Rogers WH, Kosinski M, Ware JE, Tarlov AR.** Linking primary care performance to outcomes of care. J Fam Pract. 1998;47:213–20.
18. **Carpenter WR, Godley PA, Clark JA, et al.** Racial differences in trust and regular source of patient care and the implications for prostate cancer screening use. Cancer. 2009;115:5048–59.
19. **Anderson LA, Dedrick RF.** Development of the Trust in Physician Scale: A measure to assess interpersonal trust in patient–physician relationships. Psychol Rep. 1990;67:1091–100.
20. **Bickell NA, Weidmann J, Fei K, Lin JJ, Leventhal H.** Underuse of breast cancer adjuvant treatment: patient knowledge, beliefs, and medical mistrust. J Clin Oncol. 2009;27:5160–7.
21. **Nummela O, Sulander T, Rahkonen O, Uutela A.** The effect of trust and change in trust on self-rated health: a longitudinal study among aging people. Arch Gerontol Geriatr. 2009;49:339–42.
22. **Armstrong K, Rose A, Peters N, Long JA, McMurphy S, Shea JA.** Distrust of the health care system and self-reported health in the United States. J Gen Intern Med. 2006;21:292–7.
23. **Gibbons R, Landry F, Blouch D, et al.** A comparison of physicians' and patients' attitudes toward pharmaceutical industry gifts. J Gen Intern Med. 1998;13:151–54.
24. **Mainous AG, III, Hueston WJ, Rich EC.** Patient perceptions of physician acceptance of gifts from the pharmaceutical industry. Arch Fam Med. 1995;4:335–9.
25. **Campbell E, Gruen R, Mountford J, Miller L, Clearly P, Blumenthal D.** A national survey of physician-industry relationships. N Engl J Med. 2007;356:1742–50.
26. **Shea J, Micco E, Dean L, McMurphy SS, JS, Armstrong K.** Development of a revised Health Care System Distrust scale. J Gen Intern Med. 2008;23:727–32.
27. **Safran D, Kosinski M, Tarlov A, et al.** The primary care assessment survey: tests of data quality and measurement performance. Med Care. 1998;36:728–39.
28. **Davis JAS, Tom W, Peter V.** General social surveys, 1972–2008: cumulative codebook / Principal Investigator, James A. Davis; Director and Co-Principal Investigator, Tom W. Smith; Co-Principal Investigator, Peter V. Marsden. Chicago: National Opinion Research Center; 2009.
29. Standard definitions: final dispositions of case codes and outcome rates for surveys. Lenexa, Kansas: The American Association for Public Opinion Research; 2004.