HMOs and Patient Trust in Physicians: A Longitudinal Study[*]

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Abstract: Patients in health maintenance organizations (HMOs) often trust their physicians less than those with other forms of insurance coverage. Recent studies have reported a backlash of criticism against managed care, especially HMOs. In response to this, some have argued that managed care has become more responsive to patients' wishes. We use data from the Community Tracking Study (CTS) Household Survey 1996-2003 and investigate whether HMOs have made progress in improving patient trust in physicians. We construct and compare a patient trust index among four health insurance types: non-HMO private insurance, HMO private insurance, public insurance, and uninsured. Ordinary least squares (OLS) estimation is used to examine the effects of each insurance type on the patient trust index, adjusting for confounding variables. HMOs have steadily improved patient trust in physicians from 1996 to 2003, although the patient trust index of private HMO enrollees remained lower than that of private non-HMO insured people. Among the four insurance types examined, only HMOs enhanced patient trust during this period. The growth in trust over time among patients in HMOs and the decline in the adverse effects of HMOs on patient trust over time point to improved relationships between HMO physicians and their patients.

Keywords: Patient Trust, HMOs, Health Insurance

JEL Classification: I11 I13

1. Introduction

During the past several decades, a major cost control development in the US health system has been the growth in managed care health plans, with health maintenance organizations (HMOs) emerging as an important type of managed care (Kaiser Family Foundation, 2002a). Although early HMOs were typically non-profit, many HMO plans converted from non-profit to for-profit during the 1980s and early 1990s (Moran and Savela, 1986; Shen, 2009). As a result, the proportion of HMO enrollees in for-profit HMOs increased from 12 percent in 1981 to 63 percent by 1997. Thereafter, the distribution of HMO enrollment by ownership status remained fairly stable (Kaiser Family Foundation, 2002b; Shen, 2009). National HMO enrollment reached a peak of 80.5 million enrollees by 1999, compared to 40 million in 1990, and experienced a small decline after that (Simonet, 2007; Cooper et al., 2006; Gabel et al., 2004).

Typically, HMOs provide strong incentives for physicians to limit care. The multiple cost control restrictions imposed by HMOs, such as limited physician choice, physician gatekeeper requirements, drug formulary use, physician profiling, prior approval and capitated payments,

have resulted in criticisms from both patients and physicians (Reed and Trude, 2002; Thom et al., 2004; Fang et al., 2009; Fang and Rizzo, 2009). Restrictive practices in managed care that limit patient choice may compromise trust in physicians (Mechanic, 1996; Mechanic and Schlesinger, 1996). Patients have grown increasingly concerned that HMO physicians care more about cutting costs than promoting patient health, which may serve to erode patient trust (Feldman et al., 1998; Kao et al., 1998a, 1998b; Gallagher et al., 2001; Ahern and Hendryx, 2003).

Moreover, some observers have argued that the negative media exposure of HMOs spread mistrust to consumers who were not previously dissatisfied with their health plans (Blendon et al., 1998). A breakdown of patient trust may compromise the doctor-patient relationship (Kao et al., 1998a; Thom et al., 2004). Nevertheless, the backlash of public opinion against HMOs did little to prevent their rapid growth in the 1990s (Marquis et al., 2005).

Patient trust is fundamental to the doctor-patient relationship, which plays an essential role in the delivery of medical services (Emanuel, 1995; Mechanic, 1998; Davies, 1999; Hall et al., 2001). Patient trust has long been viewed as an essential collective good or kind of social capital (e.g., spending time with patients to develop a stock of goodwill) that is important for a well-functioning health care system (Hall, 2001; Thom et al., 2004). Due to their limited ability to process and value health information, patients have to rely on their physicians to work in their best interests. A trusting doctor-patient relationship has several potential benefits, such as better adherence to medical treatment, improved patient satisfaction, better two-way communication, reinforced continuity of care and better health outcomes (Safran et al., 1998; Thom et al., 1999; Pearson and Raeke, 2000). Trust may also be associated with lower transaction costs and improved efficiency of health care by avoiding unnecessary time to reassure patients, or by avoiding inefficiencies due to incomplete disclosure of information by the patient (Creed and Miles, 1996). Therefore, patient trust serves to reinforce the proper function of a health care system (Thom et al., 2004).

Several studies suggest that the rise of managed care in the 1980s and 1990s coincided with a declining trend in patients' trust, which began in the fee-for-service era (Gray, 1997; Ahern and Hendryx, 2003; Haas et al., 2003). Meanwhile, in response to such widespread concern, states enacted numerous patient protection laws mandating the provision of specific health insurance benefits, including direct access to some specialists, financial incentive disclosure, and the ability to obtain services from out-of-network physicians. Managed care plans relaxed many restrictive practices, such as closed physician networks, prior authorization, and concurrent review controls (Mays et al., 2003; Marquis et al., 2005), and also initiated extensive trust-building programs (Mechanic and Rosenthal, 1999). These changes may have enabled managed care to improve patient's trust in doctors. Fang and Rizzo (2008) provide empirical evidence that managed care, particularly HMOs, reduced its restrictions on physicians' provision of health services, but very few empirical studies have analyzed the changing effects of managed care on other aspects of care that patients value, such as trust in their providers.

Our paper attempts to bridge this gap by examining the association between HMOs and the doctor-patient relationship in a longitudinal analysis. The Community Tracking Study (CTS) Household Survey, designed by the Center for Studying Health System Change, affords the opportunity to aggregate four waves of data from 1996 to 2003, allowing us to study the

changing effects of HMOs on patient trust. Specifically, we investigate whether HMOs have a negative effect on patient trust in physicians and how this relationship has evolved during the period 1996-2003, compared to other health insurance types.

2.　Conceptual Framework

2.1 Defining Patient Trust

Patient trust has for many years been recognized as a key component in the physician-patient relationship (Hall et al., 2002b; Mechanic, 1996; Pellegrino et al., 1991; Parsons, 1951; Peabody, 1927). As Hall et al. (2002b, p. 298) note, trust is "related to, but distinct from, satisfaction." The distinguishing feature is that, while is that satisfaction is based upon prior experience, trust is forward-looking.

To conceptualize patient trust, it is important to draw the distinction between social trust and interpersonal trust in the health care sector. Social trust refers to beliefs about the functioning of the health care system as a whole (Mechanic, 1998; Hall et al., 2002a). Interpersonal trust is trust that is developed through repeated, positive individual interactions between two parties (Mechanic, 1996). While we recognize that these two categories of trust are related (Hall et al., 2002a), our primary focus is on interpersonal trust in specific physicians.

Patient trust in the physician is a complex concept. It has been defined as "a set of beliefs or expectations that a physician will behave in a certain way" or "a reassuring feeling of confidence or reliance in the physician and the physician's intent" (Pearson and Raeke 2000). Mayer et al. (1995) have defined trust as:

> *The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the monitor to control that other party (p. 712).*

Patient trust has been conceptualized as consisting of a number of key components, including fidelity, competence, honesty, confidentiality, and global trust (Hall et al., 2002b; Safran et al., 1998; Kao et al., 1998b) or as technical competency, interpersonal competency, and agency (Thom et al., 2004; Mechanic and Schlesinger, 1996; Anderson and Dedrick, 1990). Hall et al. (2001, 2002b) provide a detailed discussion of this issue. The attributes that comprise a patient's trust level are not mutually exclusive. Researchers have attempted to develop separate subscales for each dimension of trust and then integrate them into a single-factor trust concept. Therefore, a patient's overall trust in her physician may be viewed on a continuum from low to high. Patient trust is also subject to change as patients learn through more experience with their physicians (McGuire, 1981; Thom et al., 2004).

2.2 Measuring Patient Trust

The first validated instrument used as an indicator of trust was introduced by Anderson and Dedrick (1990) and was composed of 11 items from answers in the form of a 5-point Likert format that assesses patient trust in their physicians on the domains of dependability, confidence,

and confidentiality. Safran et al. (1998) measure patient trust using 8-point Likert-scaled questions devised to assess the trust domains of integrity, agency, and competence. Kao and colleagues (1998b) also develop a validated measure of patient trust, called the Patient Trust Scale. Hall et al. (2002b) develop and validate a scale measuring patient trust in their primary care providers. This scale is similar to the Kao et al. (1998b) scale in terms of internal consistency, variability, and range of values, but has better discriminatory power.

Although these trust scales demonstrate high reliability and good construct validity, patient trust in physicians appears to be *unidimensional* (Hall et al. 2002b). That is, patients do not seem to differentiate between different dimensions of trust in their physicians, even though theory predicts that they could differentiate between a physician's skills and the extent to which the physician cares about them.

3. Methods

3.1 Data

The CTS Household Survey is a large-scale longitudinal study providing nationally representative data of health system change and its effects on the U.S. non-institutionalized population. It has six household waves to date (1996–1997, 1998–1999, 2000–2001, 2003, 2007 and 2010), and information on approximately 25,000–33,000 families and 47,000–60,000 individuals is collected in each wave. The survey samples were concentrated in 60 communities (called CTS survey sites) randomly selected across the United States using stratified sampling with probability in proportion to population size to ensure adequate representation of the US population. The majority of the respondents were obtained through random-digit dialing, supplemented by a small field sample to represent households without telephones.

A detailed description of the plan and operation for the CTS has been provided elsewhere (Kemper et al., 1996; Metcalf et al., 1996). Briefly, however, the interview sample for CTS consisted of persons of all ages in families within households. Survey respondents were asked a comprehensive set of questions concerning detailed information on patient trust in their physicians, types of health insurance coverage, health status, and socio-demographic characteristics. The present study utilizes the first through forth waves of the CTS data, because the 2007 and 2010 surveys didn't include the questions about patient trust. Our analyses are limited to adults who are aged 18 years and over, and exclude approximately 10 percent of respondents who didn't answer the trust-related survey questions. In addition, the 2007 Area Resource File (ARF) is linked to the CTS Household Survey by Federal Information Processing Standards (FIPS) state and county codes to provide information on physician density at the market level, resulting in an exclusion of 6 percent of observations which cannot be linked. We have a total sample size of 146,931, with 38,354 observations from 1996-1997, 37,144 observations from 1998-1999, 39,714 observations from 2000-2001, and 31,719 observations from 2003.

3.2 Variables

The outcome variable for this study is a patient trust index constructed using four survey

questionnaires about individuals' trust in physicians that were asked on the CTS surveys. We follow previous research (Hunt et al., 2005) that used the CTS data to construct a patient trust index. Respondents were asked to think about their usual or last physician visit and to indicate whether they agreed with the following four statements:

(1)   *"I think my doctor may not refer me to a specialist when needed"*;

(2)   *"I trust my doctor to put my medical needs above all other considerations when treating medical problems"*;

(3)   *"I think my doctor is influenced by health insurance company rules when making decision about my medical care"*;

(4)   *"I sometimes think that my doctor might perform unnecessary tests or procedures"*.

Each of the four statements has a response ranging from 1 to 5, which indicates "strongly disagree", "somewhat disagree", "neither agree/disagree", "somewhat agree", and "strongly agree". We reverse-coded the second item, so that higher scores indicated greater trust for each question. We then constructed the measurement of overall patient trust by averaging responses to all four trust-related questions, which has a Cronbach's α reliability of 0.63. Although the trust scale in CTS is not exactly identical to validated trust scales in the literature which include more dimensions of trust, the individual components of our scale are virtually identical to questionnaire items used in those scales (Pearson and Raeke, 2000; Doescher et al., 2000).

The critical independent variables are types of health insurance coverage. We first construct indicators of private insurance, public insurance and uninsured. Private insurance includes employer-provided health insurance, direct purchases from the private insurance market, and other private coverage. Private insurance is further classified into two plan types: non-HMO private insurance and HMO private insurance. Public insurance includes Medicare, Medicaid, military insurance, and other public insurance. Thus, we have four dummy variables for each health insurance type (non-HMO private insurance, HMO private insurance, public insurance and uninsured) and use non-HMO private insurance as the reference group.

We also control for a number of potential confounders that could affect patient trust. We include age (coded as 18-24, 25-34, 35-54, 55-64, and 65 and above), gender (female=1), race/ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic Other, and Hispanic), residential area (indicators of large metro over 200,000, small metro under 200,000 and non-metro area), and family structure (single, single with children, married with no children, married with children, and others). Education is measured in 5 categories from less than 12 years, 12 years, 13-15 years, 16 years and more than 16 years. We measure income by the Poverty Income Ratio, a ratio of family income to the US Census Bureau's poverty threshold for the calendar year the individual was interviewed, and it is categorized as less than 100% of the poverty level, 100-199% of the poverty level, 200-299% of the poverty level, 300-399% of the poverty level, and 400% of the poverty level or more. Self-reported overall health status is also included.

Community level covariates include the percentage of HMO enrollees in the county, capturing the HMO market penetration rate, and the number of active non-federal physicians per 1,000 population in the county. We also include a binary variable indicating whether the insurance plan

requires individuals to sign up with certain doctors or groups of doctors, which may help capture differences in restrictions between HMO plans that may reflect ownership or plan model type.

3.3 Econometric method

We analyze variations in patient trust measures by health insurance types, study their changes from 1996 to 2003, and test for any statistically significant changes in the effects of HMOs on patient trust over time. Bivariate analyses using analysis of variance (ANOVA) are employed to study whether the patient trust measures have varied across the different health insurance types. We then employ ordinary least squares (OLS) regressions to model the association between HMOs and patient trust after adjusting for confounding variables for each wave separately. The magnitudes of the estimates on HMOs in each cross-sectional wave are compared to track the changing effect of HMO on doctor-patient relationships over time. Finally, we pool all four waves of data and conduct the multivariate analysis in a longitudinal framework by adding year dummy variables as well as interaction terms between insurance types and year dummies, to identify the changing trends of patient trust by health insurance types and also check their statistical significance.

4. Results

Table 1 shows descriptive statistics for patient trust, health insurance types and the characteristics of the population by year (1996, 1998, 2000, and 2003) from the CTS household surveys and Area Resource File (ARF). In general, the patient trust index for the entire sample rose slightly from 4.12 to 4.16. The percentage of people enrolled in HMO private insurance peaked at 38 percent in 1998, declining thereafter to 35 percent in 2000 and 31 percent in 2003. Public health insurance programs experienced a large expansion from 22 percent in 1996 to 28 percent in 2003, whereas all private insurance fell from 69 percent in 1996 to 64 percent in 2003. The share of the uninsured remained steady at approximately 8-9 percent. These trends in enrollment in difference insurance types are consistent with previous studies (Shen and Melnick, 2006; Gruber and Simon, 2008). The table also indicates that the socioeconomic and demographic characteristics of the study sample are quite similar across different waves.

Table 2 shows the patient trust index by health insurance status from 1996 to 2003. Among the four categories, we find a statistically significant trend (p-value<0.01) showing an improvement in patient trust among those enrolled in HMO private insurance, from 4.02, 4.06, 4.10 to 4.12. Patient trust also increased slightly among those covered by non-HMO private insurance, and is statistically significant at the five percent level. Publicly-insured respondents reveal no changes in trust over time, while trust appears to have trended downward among uninsured individuals. In contrast to the overall increasing trend of patient trust, shown in Table 1, changes in trust vary over time by insurance status, with HMO enrollees demonstrating the most significant improvement in patient trust.

Table 3 reports on each of the four dimensions of the patient trust index by health insurance status from 1996 to 2003. Each dimension of trust improved significantly over time among HMO enrollees (p-value<0.01). In contrast, those covered by non-HMO private insurance became more likely to perceive that health plans' influence their physicians' decision making (p-

value<0.01), but were still more trusting over time on the other three dimensions (p-value<0.01). Trust was fairly stable over time for publicly-insured individuals. The uninsured were significantly more likely to believe their doctor might not refer them to a specialist when needed, and that their doctors would be strongly influenced by insurance plans when making decisions.

Table 4 provides selected coefficients from the OLS regressions when we estimate the effects of health insurance on patient trust separately for each of the four waves of CTS data (selected coefficients are reported in the interest of brevity, but the full regression models are available from the authors on request). Compared to non-HMO private insurance, HMO private insurance is significantly negatively associated with patient trust levels in each wave, but this negative effect declines steadily, from -0.10 in 1996, to -0.06 in 2003. The multivariate evidence is thus consistent with the bivariate analyses in Table 2 suggesting that the negative effect of HMOs on patient trust has declined over time. We again find that public insurance is associated with lower trust than non-HMO private insurance from 1996 to 2003. Uninsured people again have the lowest levels of trust in physicians compared to other insurance types.

Table 5 provides multivariate evidence for the pooled model using all four waves of data and interacting year with insurance status. Taking non-HMO private insurance in 1996 as the reference group, we find that the coefficient of HMO private insurance is -0.10 and is statistically significant at 1 percent, which is consistent with our cross-sectional analysis using 1996 data shown in Table 4. The interaction terms between HMOs and year dummies are all positive and, for the years 2000 and 2003, these interactions are statistically significant at the 1 percent level. These results suggest that, despite the negative correlation between HMOs and patient trust, these organizations have made significant progress in improving doctor-patient relationships. In contrast, we find no similar improvements in trust for any of the other insurance types. Indeed, for publicly-insured and uninsured respondents, patient trust appears to have eroded over time.

Other results indicate that patient trust among females is significantly higher than that for males. Minorities have significantly lower trust in physicians than non-Hispanic Whites, the reference cohort. We also find that older respondents exhibit more trust in physicians than do younger respondents. Better-educated and wealthier respondents have greater trust in their physicians. Possibly, individuals with higher socioeconomic status are better able to match with physicians in whom they can trust. They may also enjoy a comparative advantage in their ability to monitor and evaluate physician decision, which could alleviate anxiety and promote trust. People living with others trust doctors more than singles, and those with children trust more than those without. Health status is positively associated with trust in physicians. HMO market penetration, as measured by percentage of HMO enrollees at the FIPS county level, is statistically insignificant. Plan restriction in choice of doctors is negatively associated with patient trust at the 1 percent significance level. We find a positive and significant relationship between physician density and patient trust. Possibly, in more competitive (e.g., physician –dense) areas, physicians are more attentive to their patients' needs in order to attract and retain them, leading to greater trust.

This study has some important limitations that must be noted. First, we measure patient trust in physicians based on four self-reported dimensions. But patient trust is a complex, multi-faceted construct (Anderson and Dedrick, 1990; Safran et al., 1998; Kao et al., 1998a, 1998b; Hall et al., 2002b) and our analysis may not have captured all of the relevant dimensions of trust. Second,

we don't have measures of different HMO ownership status (e.g., for-profit and non-profit) in the CTS Household Survey, which may vary in their effects on patient trust in their physicians (Mechanic and Rosenthal, 1999). However, HMO ownership status was quite stable during the time period of our analysis (Kaiser Family Foundation, 2002b; Shen, 2009). Moreover, the variable measuring whether the health plan restricts patient choice helps to control for HMO heterogeneity. Third, while we have attempted to control for a variety of confounding factors that may affect both insurance type and trust, it is possible that important factors we were unable to measure have been omitted. The consistency of our bivariate and multivariate results does suggest however that the relationships between trust and insurance status were robust to the large number of covariates that we were able to control for.

5. Conclusion

This study finds that the negative effect of HMO enrollment on patient trust declined significantly from 1996 to 2003. This finding is robust to bivariate analyses, multivariate analyses of cross sectional data, and multivariate analyses of longitudinal data with interaction terms. Overall patient trust increased over this time period, and our results suggest that this improvement may be solely due to HMOs.

We find wide variations in patient trust, not only by insurance status, but also by socioeconomic and demographic characteristics. Less-well educated people, minorities, and poorer individuals exhibit markedly less trust in their physicians. This may have very significant adverse implications for access to care and quality of care among these groups.

Our results suggest that HMOs have begun to realize the limitations of restrictive practices and their negative effects on patient trust. During the past decade, patient trust under HMOs has been rising consistently. The growth in trust over time among patients in HMOs and the decline in the adverse effects of HMOs on patient trust over time point to improved relationships between HMO physicians and their patients. Greater trust may promote patient satisfaction, continuity of care, and willingness to recommend the physician (Hall et al., 2002b). Tempering these conclusions are the observations that trust levels remain lower among people with HMO insurance than individuals with other forms of insurance, and HMOs still exert a more negative effect on patient trust relative to other insurance types. But if the trend toward convergence continues, patients may increasingly choose their insurance on the basis of cost and services covered, rather than on concerns about quality of care and quality of the physician/patient encounter by health insurance types.

Given limited information, many patients find it quite challenging to compare alternative complex insurance contracts and to judge the quality of medical services. Thus HMO insurance plans are properly viewed as an experience good (Sloan and Hall, 2002). With more experience with HMOs, patient trust in their HMO providers may have improved (McGuire, 1983; Thom et al., 2004). This could also help explain the improved trust among HMO enrollees over time.

At the same time, growth in health care information via the Internet, media, and other sources, and greater patient participation in medical decision making – a phenomenon referred to in the literature as "consumerism" (Smith, 1997; Robinson, 2005; Bloche, 2006) – point to further

changes in the doctor-patient relationship, including changes in trust. Understanding how these changes affect patient trust is an important topic for future research. Another direction for further study is understanding how much trust is optimal (Davies and Rundall, 2000). Conceivably, a healthy level of skepticism among patients could promote more careful monitoring of physician behavior and enhance quality of care.

Endnotes

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References:

Ahern, M. M. and M. S. Hendryx. 2003. "Social Capital and Trust in Providers," *Social Science and Medicine*, 57 (7), 1195–1203.

Anderson, L. A. and R. F. Dedrick. 1990. "Development of the Trust in Physician Scale: A Measure to Assess Interpersonal Trust in Patient-Physician Relationships," *Psychological Reports*, 67 (3 Pt 2), 1091–1100.

Blendon, R. J., M. Brodie, J. M. Benson, D. E. Altman, L. Levitt, T. Hoff, and L. Hugick. 1998. "Understanding the Managed Care Backlash," *Health Affairs,* 17 (4), 80–94.

Bloche, M. G. 2006. "Consumer-Directed Health Care," *New England Journal of Medicine,* 355 (17), 1756–1759.

Cooper, P. F., K. I. Simon, and J. Vistnes. 2006. "A Closer Look at the Managed Care Backlash," *Medical Care,* 44 (5), 4–11.

Creed, W. E. D. and R. Miles. 1996. "Trust in Organizations. A Conceptual Framework Linking Organizational Forms, Managerial Philosophies, and the Opportunity Cost of Control," In *Trust in Organizations: Frontiers of Theory and Research*, ed. R. M. Kramer and T. R. Tyler, 16–39. Thousand Oaks, CA: Sage Publications.

Davies, H. 1999. "Falling Public Trust in Health Services: Implications for Accountability," *Journal of Health Services Research and Policy,* 4 (4), 193–194.

Davies, H. T. and T. G. Rundall. 2000. "Managing Patient Trust in Managed Care," *Milbank Quarterly,* 78 (4), 609–624.

Doescher, M. P., B. G. Saver, P. Franks, and K. Fiscella. 2000. "Racial and Ethnic Disparities in Perceptions of Physician Style and Trust," *Archives of Family Medicine,* 9 (10), 1156–1163.

Emanuel, E. J. and N. N. Dubler. 1995. "Preserving the Physician-Patient Relationship in the Era of Managed Care," *Journal of the American Medical Association,* 273 (4), 323–329.

Fang, H., H. Liu, and J. A. Rizzo. 2009. "Has the Use of Physician Gatekeepers Declined among HMOs? Evidence from the United States," *International Journal of Health Care Finance and Economics,* 9 (2), 183–195.

Fang, H. and J. A. Rizzo. 2008. "The Changing Role of Managed Care on Physician Financial Incentives," *The American Journal of Managed Care,* 14 (10), 653–660.

Fang, H. and J. A. Rizzo. 2009. "Managed Care and Physicians' Perceptions of Drug Formulary Use," *The American Journal of Managed Care,* 15 (6), 395–400.

Feldman, D. S., D. H. Novack, and E. Gracely. 1998. "Effects of Managed Care on Physician-Patient Relationships, Quality of care, and the Ethical Practice of Medicine: A Physician Survey," *Archives of Internal Medicine,* 158 (15), 1626–1632.

Gabel, J., G. Claxton, I. Gil, J. Pickreign, H. Whitmore, E. Holve, B. Finder, S. Hawkins, and D. Rowland. 2004. "Health Benefits in 2004: Four Years of Double-Digit Premium Increases Take their Toll on Coverage," *Health Affairs,* 23, 200–209.

Gallagher, T. H., R. F. St. Peter, M. Chesney, and B. Lo. 2001. "Patients' Attitudes toward Cost Control Bonuses for Managed Care Physicians," *Health Affairs,* 20 (2), 186–192.

Gray, B. H. 1997. "Trust and Trustworthy Care in the Managed Care Era," *Health Affairs,* 16 (1), 34–49.

Gruber, J. and K. Simon. 2008. "Crowd-out 10 Years Later: Have Recent Public Insurance Expansions Crowded out Private Health Insurance?" *Journal of Health Economics,* 27 (2), 201–217.

Haas, J. S., K. A. Phillips, L.C. Baker, D. Sonneborn, and C. E. McCulloch. 2003. "Is the Prevalence of Gatekeeping in a Community Associated with Individual Trust in Medical Care," *Medical Care,* 41 (5), 660–668.

Hall, M. A. 2001. "Arrow on Trust," *Journal of Health Politics, Policy and Law,* 26 (5), 1131–1144.

Hall, M. A., E. Dugan, B. Zheng, and A. K. Mishra. 2001. "Trust in Physicians and Medical Institutions: What is it, Can it be Measured, and Does it Matter?" *Milbank Quarterly,* 79 (4), 613–639.

Hall, M. A., F. Camacho, E. Dugan, and R. Balkrishnan. 2002a. "Trust in the Medical Profession: Conceptual and Measurement Issues," *Health Services Research,* 37 (5), 1419–1439.

Hall, M. A., B. Zheng, E. Dugan, F. Camacho, K. E. Kidd, A. Mishra, and R. Balkrishnan. 2002b. "Measuring Patients' Trust in their Primary Care Providers," *Medical Care Research and Review,* 59 (3), 293–318.

Hunt, K. A., A. Gaba, and R. Lavizzo-Mourey. 2005. "Racial and Ethnic Disparities and Perceptions of Health Care: Does Health Plan Type Matter?" *Health Services Research,* 40 (2), 551–576.

Kaiser Family Foundation. 2002a. *Kaiser/HRET 2002 Employer Health Benefits Survey.* Washington, DC: National Academy Press.

Kaiser Family Foundation. 2002b. *Trends and Indicators in the Changing Health Care Marketplace*, May 2002, Exhibit 5.10, p. 57, www.kff.org/insurance/3161-index.cfm.

Kao, A. C., D. C. Green, N. A. Davis, J. P. Koplan, and P. D. Cleary. 1998a. "Patients' Trust in their Physicians: Effects of Choice, Continuity, and Payment Method," *Journal of General Internal Medicine,* 13 (10), 681–686.

Kao, A. C., D. C. Green, A. M. Zaslavsky, J. P. Koplan, and P. D. Cleary. 1998b. "The Relationship between Method of Physician Payment and Patient Trust," *The Journal of the American Medical Association,* 280 (19), 1708–1714.

Kemper, P., D. Blumenthal, J. M. Corrigan, P. J. Cunningham, S. M. Felt, J. M. Grossman, L. T. Kohn, C. E. Metcalf, R. F. St Peter, R. C. Strouse, and P. B. Ginsburg. 1996. "The Design of the Community Tracking Study: A Longitudinal Study of Health System Change and its Effects on People," *Inquiry,* 33 (2), 195–206.

Marquis, S. M., J. A. Rogowski, and J. J. Escarce. 2005. "The Managed Care Backlash: Did Consumers Vote with their Feet?" *Inquiry,* 41 (4), 376–390.

Mayer, G. C., J. H. Davis, and F. D. Schoorman. 1995. "An Integrative Model of Organization Trust," *The Academy of Management Review,* 20 (3), 709–734.

Mays, G. P., R. E. Hurley, and J. M. Grossman. 2003. "An Empty Toolbox? Changes in Health Plans' Approaches for Managing Costs and Care," *Health Services Research,* 38 (1 pt 2), 375–393.

McGuire, T. G. 1983. "Patients' Trust and the Quality of Physicians," *Economic Inquiry,* 21 (2), 203–222.

Mechanic, D. 1996. "Changing Medical Organization and the Erosion of Trust," *Milbank Quarterly,* 74 (2), 171–189.

Mechanic, D. and M. Schlesinger. 1996. "The Impact of Managed Care on Patients' Trust in Medical Care and their Physicians," *Journal of the American Medical Association,* 275 (21), 1693–1697.

Mechanic, D. 1998. "The Functions and Limitations of Trust in the Provision of Medical Care," *Journal of Health Politics, Policy and Law,* 23 (4), 687–695.

Mechanic, D. and M. Rosenthal. 1999. "Responses of HMO Medical Directors to Trust Building in Managed Care," *Milbank Quarterly,* 77 (3), 283–303.

Metcalf, C. E., P. Kemper, L. T. Kohn, and J. D. Pickreign. 1996. "Site Definition and Sample Design for the Community Tracking Study," *Technical Publication No.1.* Washington, DC: Center for Studying Health System Change.

Moran, D. W. and T. E. Savela. 1986. "HMOs, Finance, and the Hereafter," *Health Affairs,* 5 (1), 51–65.

Parson, T. 1951. *The Social System.* Glencoe, IL: Free Press.

Peabody, F.W. 1927. "The Care of the Patient," *Journal of the American Medical Association,* 88 (12), 877–882.

Pearson, S. D. and L. H. Raeke. 2000. "Patients' Trust in Physicians: Many Theories, Few Measures, and Little Data," *Journal of General Internal Medicine,* 15 (7), 514–516.

Pelligrino, E. D., R. M. Veatch, and J. P. Langan. 1991. *Ethics, Trust, and the Professions: Philosophical and Cultural Aspects.* Washington, DC: Georgetown University Press.

Reed, M. C. and S. Trude. 2002. "Who do You Trust? Americans' Perspectives on Health Care, 1997–2001," *Tracking Report,* (3), 1–4.

Robinson, J. C. 2005. "Managed Consumerism in Health Care," *Health Affairs,* 24 (6), 1478–1489.

Safran, D. G., D. A. Taira, W. H. Rogers, M. Kosinski, J. E. Ware, and A. R. Tarlov. 1998. "Linking Primary Care Performance to Outcomes of Care," *Journal of Family Practice,* 47 (3), 213–220.

Shen, Y. 2009. "Do HMO and its for-Profit Expansion Jeopardize the Survival of Hospital Safety Net Services?" *Health Economics,* 18 (3), 305–320

Shen, Y. and G. Melnick. 2006. "Is Managed Care Still an Effective Cost Containment Device?" *Forum for Health Economics & Policy,* 9 (1), 1007.

Simonet, D. 2007. "Managed Care in the USA: Origins, HMO Strategies and the Marketing of Health Services," *Journal of Public Affairs,* 7. 357–371.

Sloan, F. A. and M. A. Hall. 2002. "Market Failures and the Evolution of State Regulation of Managed Care," *Law and Contemporary Problems,* 65 (4), 169–206.

Smith, R. 1997. "The Future of Healthcare Systems Information Technology and Consumerism will Transform Health Care Worldwide," *British Medical Journal,* 314, 1495.

Thom, D. H., K. M. Ribisl, A. L. Stewart, and D. A. Luke. 1999. "Validation of a Measure of Patients' Trust in their Physician: The Trust in Physician Scale," *Medical Care,* 37, 510–517.

Thom, D. H., M. A. Hall, and L. G. Pawlson. 2004. "Measuring Patients' Trust in Physicians When Assessing Quality of Care," *Health Affairs,* 23 (4), 124–132.

Table 1. Name and Descriptive Statistics of Analysis Variables by Survey Years

Year	1996	1998	2000	2003	Min	Max
Sample size	N=38,354	N=37,144	N=39,714	N=31,719		
Patient trust index[a,b]	4.12	4.13	4.16	4.16	1	5
	(0.86)	(0.85)	(0.84)	(0.82)		
Health insurance type (%)						
Private insurance[c], non-HMOs	0.35	0.31	0.32	0.33	0	1
Private insurance[c], HMOs	0.34	0.38	0.35	0.31	0	1
Public insurance[d]	0.22	0.22	0.25	0.28	0	1
Uninsured	0.09	0.09	0.08	0.08	0	1
Gender (%)						
Male	0.44	0.43	0.44	0.43	0	1
Female	0.56	0.57	0.56	0.57	0	1
Race (%)						
White, non-Hispanic	0.80	0.79	0.77	0.77	0	1
Black, non-Hispanic	0.10	0.11	0.11	0.11	0	1
Other race, non-Hispanic	0.04	0.04	0.04	0.04	0	1
Hispanic	0.06	0.06	0.08	0.08	0	1
Age (%)						
18-24	0.11	0.11	0.09	0.10	0	1
25-34	0.20	0.18	0.16	0.13	0	1
35-54	0.43	0.43	0.44	0.42	0	1
55-64	0.12	0.13	0.14	0.16	0	1
65-91	0.14	0.15	0.16	0.19	0	1
Years of education (%)						
Less than 12 years	0.11	0.11	0.11	0.11	0	1
12 years	0.36	0.36	0.35	0.35	0	1
13-15 years	0.25	0.24	0.24	0.24	0	1
16 years	0.18	0.18	0.18	0.18	0	1
More than 16 years	0.11	0.11	0.12	0.12	0	1
Family structure (%)						
Single person	0.27	0.27	0.28	0.28	0	1
Single person, with kids	0.07	0.08	0.07	0.07	0	1
Married couple, without kids	0.30	0.29	0.31	0.32	0	1
Married couple, with kids	0.35	0.34	0.33	0.32	0	1
Others	0.01	0.01	0.01	0.02	0	1
Family income per person (%)						
Less than100% poverty level	0.34	0.32	0.29	0.29	0	1
100-199% poverty level	0.28	0.27	0.27	0.28	0	1
200-299% poverty level	0.15	0.16	0.16	0.16	0	1
300-399% poverty level	0.10	0.10	0.11	0.10	0	1
400% poverty level or more	0.14	0.15	0.17	0.16	0	1
MSA category (%)						
Large metro over 200,000	0.84	0.84	0.84	0.85	0	1
Small metro under 200,000	0.04	0.04	0.04	0.03	0	1
Non-metro area	0.12	0.12	0.12	0.12	0	1
Health status (%)						

Excellent	0.32	0.34	0.32	0.33	0	1
Very good	0.30	0.30	0.31	0.32	0	1
Good	0.15	0.15	0.16	0.15	0	1
Fair	0.06	0.06	0.06	0.05	0	1
Poor	0.02	0.02	0.02	0.01	0	1
HMO market penetration (%)						
HMO enrollees at the county level	0.34	0.38	0.35	0.31	0	1
Physician choice						
Plan restriction on doctor choice (%)	0.40	0.45	0.45	0.41	0	1
Physicians per 1,000 population	2.65	2.75	2.79	2.88	0	35.19

Data source: Community Tracking Study (CTS) Household Survey.

Note: (a) Patient trust index: 1, strongly distrust; 2, somewhat distrust; 3, neither trust nor distrust; 4, somewhat trust; and 5, strongly trust.

(b) Standard deviations are reported in the parentheses.

(c) Private insurance includes employer provided health insurance and direct purchase from private insurance market.

(d) Public insurance includes Medicare, Medicaid, military insurance, and other public insurance.

Table 2. Patient Trust Index by Health Insurance Types and Survey Years

Year	Patient trust index[a, b]				P value[e]
	1996	1998	2000	2003	
Sample size	N=38,354	N=37,144	N=39,714	N=31,719	
Health insurance types					
Private insurance[c], non-HMOs	4.24	4.25	4.27	4.26	0.01
	(0.80)	(0.79)	(0.78)	(0.76)	
Private insurance[c], HMOs	4.02	4.06	4.10	4.12	<0.01
	(0.87)	(0.85)	(0.84)	(0.80)	
Public insurance[d]	4.20	4.19	4.22	4.20	0.23
	(0.85)	(0.85)	(0.85)	(0.83)	
Uninsured	3.87	3.83	3.82	3.83	0.02
	(0.96)	(0.97)	(0.97)	(0.94)	

Note: (a) Patient trust index: 1, strongly distrust; 2, somewhat distrust; 3, neither trust nor distrust; 4, somewhat trust; and 5, strongly trust.

(b) Standard deviation is reported in parentheses.

(c) Private insurance include employer provided health insurance and direct purchase from private insurance market.

(d) Public insurance includes Medicare, Medicaid, military insurance, and other public insurance.

(e) Tests are based on analysis of variance (ANOVA) for each insurance type by years.

Table 3. Each Dimension of Patient Trust by Health Insurance Types and Survey Year

	"I think my doctor may not refer me to a specialist when needed."				
Year	1996	1998	2000	2003	P value[e]
Sample size	N=38,354	N=37,144	N=39,714	N=31,719	
Health insurance types					
Private insurance[c], non-HMOs	4.49	4.49	4.52	4.55	<0.01
	(1.04)	(1.05)	(1.03)	(0.99)	
Private insurance[c], HMOs	4.21	4.26	4.31	4.36	<0.01
	(1.28)	(1.26)	(1.23)	(1.17)	
Public insurance[d]	4.33	4.31	4.34	4.33	0.01
	(1.28)	(1.30)	(1.28)	(1.30)	
Uninsured	4.11	3.97	3.97	3.98	<0.01
	(1.36)	(1.46)	(1.47)	(1.45)	
	"I trust my doctor to put my medical needs above all other considerations when treating my medical problems."				
Health insurance types					
Private insurance[c], non-HMOs	4.56	4.58	4.59	4.60	<0.01
	(0.87)	(0.85)	(0.83)	(0.80)	
Private insurance[c], HMOs	4.40	4.44	4.50	4.54	<0.01
	(1.00)	(0.96)	(0.92)	(0.87)	
Public insurance[d]	4.62	4.62	4.64	4.64	0.45
	(0.86)	(0.88)	(0.86)	(0.85)	
Uninsured	4.32	4.40	4.35	4.37	<0.01
	(1.13)	(1.03)	(1.11)	(1.06)	
	"I think my doctor is strongly influenced by health insurance company rules when making decisions about my medical care."				
Health insurance types					
Private insurance[c], non-HMOs	3.51	3.50	3.51	3.44	<0.01
	(1.53)	(1.54)	(1.53)	(1.52)	
Private insurance[c], HMOs	3.07	3.10	3.15	3.11	<0.01
	(1.59)	(1.58)	(1.57)	(1.56)	
Public insurance[d]	3.42	3.42	3.44	3.40	<0.01
	(1.66)	(1.67)	(1.66)	(1.65)	
Uninsured	2.98	2.92	2.92	2.91	0.02
	(1.64)	(1.65)	(1.65)	(1.63)	
	"I sometimes think that my doctor might perform unnecessary tests or procedures."				
Health insurance types					
Private insurance[c], non-HMOs	4.40	4.44	4.47	4.45	<0.01
	(1.12)	(1.07)	(1.05)	(1.06)	
Private insurance[c], HMOs	4.40	4.45	4.46	4.45	<0.01
	(1.10)	(1.06)	(1.08)	(1.06)	

Public insurance[d]	4.42	4.41	4.45	4.42	0.33
	(1.13)	(1.16)	(1.14)	(1.14)	
Uninsured	4.08	4.05	4.05	4.06	0.25
	(1.37)	(1.40)	(1.40)	(1.40)	
Cronbach's α	0.64	0.63	0.63	0.61	

Note: (a) Each trust dimension: 1, strongly distrust; 2, somewhat distrust; 3, neither trust nor distrust; 4, somewhat trust; and 5, strongly trust.

(b) Standard deviation is reported in parentheses.

(c) Private insurance include employer provided health insurance and direct purchase from private insurance market.

(d) Public insurance includes Medicare, Medicaid, military insurance, and other public insurance.

(e) Tests are based on analysis of variance (ANOVA) for each insurance type by years.

Table 4. Selected Coefficients of OLS Estimation Using Each Survey Year' Data Separately

Variables[a]	Dependent variable: patient trust index							
	1996		1998		2000		2003	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Health insurance types								
Private insurance, non-HMOs	reference group		reference group		reference group		reference group	
Private insurance, HMOs	-0.10	<0.01	-0.09	<0.01	-0.06	<0.01	-0.06	<0.01
Public insurance	-0.11	<0.01	-0.12	<0.01	-0.12	<0.01	-0.05	<0.01
Uninsured	-0.25	<0.01	-0.30	<0.01	-0.31	<0.01	-0.28	<0.01

Note: (a) OLS estimation also controls for HMO market penetration, plan restriction on doctor choice, physicians per 1,000 population, gender, race, age, education, family structure, family income per person, living in MSA, and self-reported health status.

Table 5. OLS estimation Using Pooled Data from 1996 to 2003 and Including Interaction Terms between Health Insurance Types And Year Dummy Variables

Variables	Dependent variable: patient trust index	
	Coefficient	P value
Health insurance types		
Private insurance, non-HMOs	reference group	
Private insurance, HMOs	-0.10	<0.01
Public insurance	-0.09	<0.01
Uninsured	-0.24	<0.01
Interaction terms between health insurance types and years		
Private insurance, HMOs * 1998	0.01	0.38
Private insurance, HMOs * 2000	0.04	<0.01
Private insurance, HMOs * 2003	0.05	<0.01
Public insurance * 1998	-0.02	0.16
Public insurance * 2000	-0.02	0.10
Public insurance * 2003	-0.02	0.22
Uninsured * 1998	-0.05	0.03
Uninsured * 2000	-0.07	<0.01
Uninsured * 2003	-0.06	0.01
Year		
1996	reference group	
1998	0.01	0.27
2000	0.03	<0.01
2003	0.01	0.52
Gender		
Male	reference group	
Female	0.12	<0.01
Race		
White, non-Hispanic	reference group	
Black, non-Hispanic	-0.15	<0.01
Other race, non-Hispanic	-0.19	<0.01
Hispanic	-0.17	<0.01
Age		
18-24	reference group	
25-34	-0.04	<0.01
35-54	0.00	0.77
55-64	0.09	<0.01
65-91	0.20	<0.01
Years of education (highest grade completed)		
Less than 12 years	reference group	
12 years	0.15	<0.01
13-15 years	0.20	<0.01
16 years	0.20	<0.01
More than 16 years	0.20	<0.01
Family structure		
Single person	reference group	

Single person, with kids	0.06	<0.01
Married couple, without kids	0.01	0.04
Married couple, with kids	0.03	<0.01
Others	0.07	<0.01
Family income per person		
Less than100% poverty level	reference group	
100-199% poverty level	0.06	<0.01
200-299% poverty level	0.10	<0.01
300-399% poverty level	0.11	<0.01
400% poverty level or more	0.13	<0.01
MSA category		
Large metro over 200,000	reference group	
Small metro under 200,000	-0.02	0.07
Non-metro area	-0.00	0.75
Health status		
Excellent	reference group	
Very good	-0.09	<0.01
Good	-0.42	<0.01
Fair	-0.77	<0.01
Poor	-1.02	<0.01
HMO market penetration		
HMO enrollees at the county level	0.00	0.96
Physician choice		
Plan restriction on doctor choice	-0.11	<0.01
Physicians per 1,000 population	0.004	<0.01
Constant	4.08	<0.01