

## ABSTRACT

**Objectives.** This study determined the validity of self-reported data on selected health insurance characteristics.

**Methods.** We obtained telephone survey data on the presence of health insurance, source of insurance, length of time insured, and type of insurance (managed care or fee-for-service) from a random sample of 351 adults in 3 Wisconsin counties and compared findings with data from respondents' health insurers.

**Results.** More than 97% of the respondents correctly reported that they were currently insured. For source of insurance among persons aged 18 to 64 years, sensitivity was high for those covered through private health insurance (93.8%) but low for those covered through public insurance (6.7%). Only 33.1% of the respondents accurately categorized length of enrollment in their current plan. Overall estimates for managed care enrollment were similar for the 2 sources, but individual validity was low: 84.2% of those in fee-for-service believed that they were in managed care.

**Conclusions.** Information obtained from the general population about whether they have health insurance is valid, but self-reported data on source of insurance, length of time insured, and type of insurance are suspect and should be used cautiously. (*Am J Public Health*. 2000;90:924-928)

# What People Really Know About Their Health Insurance: A Comparison of Information Obtained From Individuals and Their Insurers

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A growing number of Americans receive health services through managed care plans,<sup>1</sup> and individuals commonly switch plans.<sup>2</sup> Because of the changing nature of health care delivery in the United States, there are increased demands on individuals to know the details of their health care plans.

Much of the information on health insurance status, type and source of insurance, receipt of health care services, patient satisfaction, and health outcomes is obtained from surveys of individuals.<sup>3-7</sup> Such data are commonly used in policy discussions. Obtaining state-specific data about health care coverage information beyond health insurance status is important, especially because health care and health insurance reform continue to occur at the state level.

There has been limited research on the validity of self-reported health insurance data. A few studies have examined the extent to which people correctly report services covered by their insurance<sup>8-10</sup> and their general knowledge about health care delivery,<sup>11,12</sup> but little research has been conducted on health insurance status<sup>3,13</sup> or type of health plan (e.g., fee-for-service or managed care).<sup>14</sup>

It would be useful to compare enrollees in managed care with those in fee-for-service plans on issues such as access to and receipt of preventive services. Population-based self-reported data on characteristics of health plans can be readily obtained from representative samples at the local, state, or national level<sup>2,3,7,14,15</sup>; such data can be collected rapidly and inexpensively through mail or telephone surveys.<sup>16</sup>

The Wisconsin Survey Research Laboratory, the Centers for Disease Control and Prevention, and the Wisconsin Department of Health and Family Services conducted a population-based study to determine whether individuals' reports about their health care insurance could be confirmed by their health insurers on the presence of health insurance, source of insurance, length of enrollment,

and enrollment in managed care or fee-for-service plans.

## Methods

Data for this study were collected in 3 phases: (1) a telephone survey of randomly selected adults in 3 Wisconsin counties, (2) household visits to respondents to obtain written permission to contact their health insurers and obtain copies of health insurance cards, and (3) mail surveys with telephone follow-up to respondents' health insurers.

### Development of Telephone Survey

Questions about health care coverage for the telephone survey were taken from the 1997 Behavioral Risk Factor Surveillance System (BRFSS) survey. Details of the BRFSS have been published elsewhere.<sup>17</sup>

An expert panel was convened by the Centers for Disease Control and Prevention in 1995 to help select health care coverage questions for the BRFSS. Panel members included representatives from academic institutions, health plans, the National Commission for Quality Assurance, the National Center for Health Statistics, the Minnesota Business Action Group on Health, and state health departments.

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The biggest challenge was classifying individuals by type of health plan (i.e., fee-for-service or managed care). The panel believed that the 2 most readily understandable features of managed care for the general population were the presence of a list of providers (provider network) and a requirement to select a specific provider or health care facility for routine care.

Based on panel recommendations, the Centers for Disease Control and Prevention staff developed questions on the presence of any type of health insurance, source of health care coverage, length of time with the current health plan, and type of health plan (the questions used in the telephone survey are available from the corresponding author). Most questions had been used in other national surveys and were slightly modified for use in a telephone survey. Questions were cognitively and field tested before use.

### Data Collection

**Pilot study.** A pilot study was conducted from December 1996 through February 1997. On the basis of the pilot phase, we provided a \$10 incentive to respondents who agreed to complete phase 2.

**Phase 1: Telephone survey.** The telephone survey was conducted between March and September 1997. To obtain data from a diversity of geographic areas, the study was conducted in 3 Wisconsin counties: a large metropolitan area (Milwaukee County), a medium-sized county (Dane County, which contains the city of Madison), and a rural county in north-central Wisconsin. These counties contain 27% of the state's population.<sup>18</sup> We randomly selected telephone numbers to select respondents, with a goal of completing 200 interviews in each county.

**Phase 2: Household visits.** Respondents who agreed to household visits were visited within 3 weeks of the telephone interview. If household visits were inconvenient or individuals objected to a home visit, alternative sites for interviews were arranged. During the visits, interviewers obtained photographs of health insurance cards and written consent to contact health insurers. Persons with more than 1 health plan were asked to provide information on the plan they considered to be their main health insurer. Our goal was to complete as many household visits as possible among persons who reported having health insurance.

**Phase 3: Verification of information from health plans.** We developed an insurance coverage verification form for health insurers (the verification questions for health insurers are available from the corresponding

author). Release-of-information forms, copies of insurance cards, and the verification form and survey were mailed to all health insurers. If the forms were not returned within 3 weeks, the investigators contacted the health insurers' staff.

### Definitions for Type of Insurance (Managed Care or Fee-for-Service)

For the telephone survey, we classified persons as enrolled in managed care if they reported that they had to (1) choose from a list of doctors (network) or (2) use a primary health care provider or clinic for routine care; otherwise, they were considered to be in fee-for-service plans. We conducted analyses defining enrollment in managed care with the network question only or with the primary care provider or clinic question only to determine the validity of using either question alone. For the insurers' survey, we considered individuals to be enrolled in managed care or fee-for-service if they were classified as such by their insurance company. We conducted additional analyses of insurers' survey data classifying respondents as enrolled in managed care or fee-for-service by using nearly identical questions and definitions as in the population survey (i.e., managed care defined as a requirement to choose from a network of providers or select a primary care provider or clinic).

### Statistical Analyses

We compared demographics for telephone survey respondents with those in the insurers' survey with *P* values. Information from health insurers was considered to be the "gold standard" for all comparisons estimating the validity of self-reported health insurance data. We used positive predictive value<sup>19,20</sup> to determine whether individuals accurately reported if they had health insurance, identified their primary insurance coverage, or had a comprehensive policy. We compared overall estimates from self-reports with insurers' reports for source of insurance, length of enrollment, and type of coverage; we used sensitivity and specificity to assess the validity of the self-reports.<sup>19,20</sup>

We restricted analyses of source of insurance data to persons aged 18 to 64 years. Source was classified as private insurance (employer-provided or individual policy purchased separately) or public insurance (Medicare, Medicaid, CHAMPUS, Veterans Administration, CHAMP-VA, military, or the Indian Health Service). Length of enrollment was classified as 1 year or less, greater than 1 year but less than or equal to 5 years, and greater than 5 years. We conducted addi-

tional analyses stratified by age, sex, education level, and whether individuals saw a physician in the past year. When sample size was sufficient (i.e., denominator of 50), we analyzed data by source of insurance.

### Results

Of the 1018 persons contacted by telephone, 611 (60%) agreed to participate, with little variation by county. Among respondents, 552 had health insurance and were eligible for phases 2 and 3.

A total of 352 of 552 eligible persons (64%) consented to the household visit. Health insurers provided information on all 352 persons; verification data on enrollment were missing for 1 person, leaving 351 respondents in the final data set. Data were obtained from 67 different health insurers. Except for county of residence, demographics of phase 1 respondents were similar to those in phases 2 and 3 (Table 1).

Individuals were very accurate in identifying that they were currently insured (positive predictive value = 97.8% ± 1.6), and this was similar by demographics, by whether respondents saw a physician in the past year, and by source of insurance (data not shown in tables). A total of 97.6% ± 1.9 of the respondents correctly identified their primary health plan and 98.7% ± 1.3 identified a comprehensive plan.

Overall estimates differed for source of insurance, with 6.6% of the telephone respondents reporting coverage through public sources compared with 19.1% based on health insurers' data (Table 2). Estimates from the telephone survey were higher than insurers' data for employer-based health insurance. Validity of individual self-reports was low, especially for those covered by public insurance (sensitivity = 6.7%). Sensitivity and specificity of self-reported data were consistently low for coverage through individuals' own or someone else's employer. Women were more likely than men to accurately report that they did not have coverage through their own employer (specificity = 56.4% ± 10.4 for women, 27.8% ± for men) or that they were insured through someone else's employer (sensitivity = 58.1% ± 13.3 for women, 17.5% ± 10.1 for men) (data not shown in tables).

Estimates for length of enrollment differed substantially between the 2 data sources for enrollment of 1 year or less or greater than 5 years (Table 2). Sensitivity and specificity of self-reported data on length of enrollment were low, because most persons overestimated how long they had been enrolled in their current plan.

**TABLE 1—Demographic Characteristics of Study Participants Who Completed the Telephone Survey (Phase 1) and of Those Who Agreed to Household Visits (Phases 2 and 3): Wisconsin, 1997**

	Phase 1 Respondents, % (n=611)	Phase 2 & 3 Respondents, % (n=351)	P
Age, y			
18-34	33.1	34.1	
35-54	41.9	41.8	
55-64	10.5	10.3	
≥65	14.5	13.8	.98
Sex			
Female	59.6	61.1	
Male	40.4	38.9	.72
Race			
White	89.5	87.5	
Non-White	8.7	10.3	
Unknown	1.8	2.2	.62
County			
Dane	28.5	34.3	
Milwaukee	36.2	43.9	
North-central rural county	35.4	21.8	<.01
Education level			
≤High school	41.2	38.5	
>High school	58.7	61.3	
Unknown	0.1	0.2	.66
Employment status			
Employed	74.7	75.4	
Unemployed	3.5	3.8	
Unable to work	2.1	1.6	
Retired	11.2	9.8	
Other	8.3	9.1	
Unknown	0.2	0.3	.96

On the basis of the insurers' survey, 70.3% of the persons were in managed care plans, and 29.7% were in fee-for-service plans (Table 3). Overall estimates from self-reports based on the network question only and from combined responses from the network and primary care provider or clinic question were similar to the overall insurers' estimate, but defining managed care based

solely on the primary care provider or clinic question produced a managed care estimate of only 50.7%.

The validity of self-reports for enrollment in managed care was low (Table 4). Although sensitivity exceeded 70% for the network definition only and for the network and primary care provider or clinic definition, specificity for both of these definitions was

less than 20%. Values for sensitivity and specificity of self-reports for enrollment in managed care were similar when compared with data that used nearly identical questions on networks and primary care provider or clinic in the insurers' survey (data not shown).

Stated somewhat differently, about three fourths of the persons who were in managed care correctly identified themselves as such, but 84.2% of the persons in fee-for-service plans incorrectly believed that they were in managed care. Sensitivity did not improve when the analysis was restricted to enrollees in health maintenance organizations or preferred provider organizations. The validity of the self-reported data on type of coverage did not differ significantly when examined by demographic and other characteristics (data not shown).

## Discussion

Although adults in this population provided valid information about their general health insurance status, validity of self-reported data on source of insurance, length of enrollment, and type of coverage was low. Our findings complement those of previous studies indicating that individuals have a poor understanding of their health insurance benefits.<sup>8-10,13</sup> Although it is unclear whether our findings can be generalized, they cast doubts on the validity of detailed data about health insurance obtained from individuals in surveys, and they suggest that policymakers should rely on information from other sources, such as health plan administrative records.

Because the vast majority of persons visit a health care provider at least once a year<sup>7</sup> and because of the potentially high cost

**TABLE 2—Agreement Between Self-Reports and Insurers' Reports for Source of Insurance and Length of Enrollment: Wisconsin, 1997**

Overall Estimates	Self-Reports (95% CI)	Health Plans (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Source of insurance <sup>a</sup>				
Private <sup>b</sup>	93.4 (91.1, 95.7)	80.9 (76.4, 85.4)	93.8 (90.5, 97.1)	6.7 (0.0, 13.4)
Own employer	57.6 (53.1, 62.1)	45.4 (39.8, 51.0)	60.4 (51.5, 69.3)	44.7 (36.7, 52.7)
Someone else's employer	29.5 (25.4, 33.6)	31.5 (26.2, 36.8)	42.7 (32.2, 53.2)	76.0 (69.8, 82.2)
Any employer	87.1 (84.1, 90.1)	76.8 (72.0, 81.6)	89.1 (84.8, 93.4)	17.5 (8.2, 26.8)
Public <sup>c</sup>	6.6 (4.3, 8.9)	19.1 (14.6, 23.6)	6.7 (4.3, 8.9)	93.8 (90.5, 97.1)
Length of enrollment, y				
≤1	13.8 (10.9, 16.7)	35.5 (29.4, 41.6)	15.9 (7.6, 24.2)	100.0 (99.9, 100.0)
1-5	27.1 (23.4, 30.8)	31.4 (25.4, 37.4)	32.2 (20.8, 43.6)	74.9 (67.8, 82.0)
>5	59.1 (55.0, 63.2)	33.1 (27.1, 39.1)	52.9 (41.0, 64.8)	38.9 (30.8, 47.0)
Overall agreement	NA	NA	33.1 (26.7, 39.5)	75.4 (72.3, 78.5)

Note. CI = confidence interval; NA = not applicable.

<sup>a</sup> Respondents aged 18 to 64 years only.

<sup>b</sup> Employer or self-paid; because of small numbers, comparisons for self-paid respondents were not feasible.

<sup>c</sup> Medicaid, Medicare, military, CHAMPUS, Indian Health Service, Veterans Administration, or CHAMP-VA.

**TABLE 3—Overall Estimates of Enrollment in Managed Care and Fee-for-Service Based on Self-Reports and Insurers' Reports: Wisconsin, 1997**

	Proportion Enrolled, % (95% CI)
Type of health insurance based on self-reports	
List (network) definition only (N=518 <sup>a</sup> )	
Managed care	75.8 (72.1, 79.5)
Fee for service	24.2 (20.5, 27.9)
Primary care provider or clinic definition only (N=540 <sup>a</sup> )	
Managed care	50.7 (46.5, 54.9)
Fee for service	49.3 (45.1, 53.5)
Either list (network) or primary care provider or clinic (N=525 <sup>b</sup> )	
Managed care	78.7 (75.2, 82.2)
Fee for service	21.3 (17.8, 24.8)
Type of health insurance based on insurers' reports (N=314 <sup>b</sup> )	
Managed care	70.3 (65.2, 75.4)
Fee for service	29.7 (24.6, 34.8)

Note. CI = confidence interval.

<sup>a</sup>N is less than 552 because of unknown and missing responses.

<sup>b</sup>N is less than 351 because of unknown and missing responses.

**TABLE 4—Sensitivity and Specificity of Self-Reported Data Compared With Insurers' Data for Length of Enrollment and Type of Health Care Coverage: Wisconsin, 1997**

	Sensitivity	Specificity
Managed care		
List of doctors (network)	72.3 (65.9, 78.7)	17.8 (9.5, 26.1)
Primary care provider or clinic	52.0 (45.0, 59.0)	48.7 (38.0, 59.4)
Either network or primary care provider or clinic	76.0 (70.0, 82.0)	15.8 (7.9, 23.7)
Managed care (HMO only)		
List of doctors (network)	75.2 (66.5, 83.9)	NA
Primary care provider or clinic	46.7 (36.8, 56.6)	NA
Either network or primary care provider or clinic	77.1 (68.7, 85.5)	NA
Managed care (PPO only)		
List of doctors (network)	74.1 (61.4, 86.8)	NA
Primary care provider or clinic	50.0 (35.8, 64.2)	NA
Either network or primary care provider or clinic	74.7 (62.2, 87.2)	NA

Note. NA = not applicable; specificity for health maintenance organization (HMO) or preferred provider organization (PPO) enrollees cannot be calculated because only persons reported by health insurers as being in managed care were asked about type of managed care arrangement.

changing of health plans, mistaking enrollment in a health plan for length of time with current health care provider, or changing type of health care delivery mode (e.g., switching from a fee-for-service to a preferred provider organization arrangement within the same health plan).

Our study found that overall estimates for enrollment in managed care from self-reports (76%–79%) were fairly similar to reports from health insurers (70%), provided that the definition of managed care from self-reports included a question on network of providers. The estimate that 70% of the insured individuals were in managed care and nearly 30% were in fee-for-service plans from this survey of insurers was similar to 1997 data for the state of Wisconsin.<sup>22</sup>

To our knowledge, only 1 other study has examined the validity of the overall estimates of managed care enrollment from self-reports with employer data. In a national survey, Blendon and colleagues<sup>14</sup> used several questions to classify persons as being in managed care or fee-for-service, including questions on choosing doctors from a list and having to pay more for doctors not on a list, selecting a primary care doctor or medical group, and obtaining a referral before seeing a doctor outside the plan. Respondents were classified as being in "heavy" managed care if they answered "yes" to all questions, in "light" managed care if they answered "yes" to at least 1 question, or in traditional (fee-for-service) plans if they answered "no" to all questions. Blendon et al.<sup>14</sup> reported that 79% of the insured respondents were in "heavy" or "light" managed care and that 21% were in traditional plans and that these findings were comparable to estimates obtained in a national survey of employers. Thus, our overall estimates of managed care enrollment from self-reports were similar to those in this national study.

The individual-level validity of self-reported data on enrollment in managed care or fee-for-service, however, tells a different story. Our work showed that defining and measuring managed care status is, at best, difficult, even when a fairly simple definition of managed care is used for the general population. We think it is unlikely that the average American would better understand more specific managed care terms such as preferred provider organization, independent practice association, or point-of-service plan. Thus, the quality of data comparing enrollees in managed care with those in fee-for-service for outcomes, satisfaction, risk factors, and receipt of preventive services is of concern if the type of coverage is based on self-reports.

The study had limitations. Persons in households without telephones were not eligible, although this had only a small effect

associated with medical visits, it was not surprising that individuals accurately identified that they had health insurance. Our findings confirm those from a 1983 study, which also found that 98% of the respondents correctly reported health insurance status.<sup>8</sup>

Self-reports substantially overestimated the extent of private insurance coverage and employer-based coverage. Validity for source of insurance was low, especially when examined by whether insurance was provided through the respondents' own employer or through someone else's employer. Women

were more likely than men to accurately report that their source of insurance was based on coverage through either their own or someone else's employer. This suggests that women may be a better source than men for this type of information, perhaps because women are more likely than men to visit health care providers<sup>7</sup> and need to know this information.

Validity for length of enrollment data also was low. Reasons may include telescoping (remembering events as occurring more recently than they actually did),<sup>21</sup> frequent

because household telephone coverage in Wisconsin is 97%.<sup>23</sup> As is typical of telephone surveys,<sup>16</sup> study participants were slightly more likely than the general population in their respective counties to be female, to be White, and to have higher levels of education.<sup>18</sup> The overall response rate, based on the estimated number of individuals with health insurance<sup>24</sup> for whom data were obtained from the telephone and the insurer survey, was only an estimated 40%. However, persons participating in phases 2 and 3 of the study were demographically similar to participants in the telephone survey.

Prevalence estimates for uninsurance, private insurance, and employment-based insurance were slightly higher for the study population than for statewide estimates from the Census Bureau.<sup>25</sup> The overall number of respondents was sufficient, for our purposes, but the sample size was not large enough to allow for extensive subpopulation analyses.

It is unclear how generalizable our findings are to data obtained via other survey modes, but use of a telephone survey probably would not substantially alter the overall findings. A more comprehensive set of questions than is used in the BRFSS could produce more valid results than the questions used in this study, although we recommend that such questions undergo extensive validity testing.

Although we used health insurers' data as a gold standard, administrative data also have limitations. Because data were obtained from multiple health insurers (many of which were based out of state) and gaining independent access to so many proprietary data systems would have been problematic, it was logistically impossible to verify insurers' responses. Administrative data obtained through a survey of insurers may not be completely accurate, but it is logical to assume that they are more accurate than data obtained from individuals for items associated with enrollment and reimbursement issues.

This study also had several notable strengths. We believe that this is the first study to examine the validity of data on source of health insurance and length of enrollment. The questions used in the survey were developed with substantial input from a panel of experts and were cognitively and field tested before actual use. Data were obtained from a representative sample of adults who resided in counties containing more than one fourth of the state's population,<sup>15</sup> and information was received from multiple health insurers.

Although the BRFSS survey instrument included a limited number of health care coverage questions, it is the only annual, nationwide source of standardized and comparable state data for health care coverage topics beyond health insurance status. As a result of

these findings, questions on choosing from a list or having a single provider or clinic are no longer included in the core BRFSS instrument, and researchers are advised not to use these questions to classify respondents as managed care or fee-for-service enrollees.

The findings presented in this study have important implications. In light of the dramatic shift toward managed care in the US health care system, obtaining accurate information about access to health care and health outcomes is necessary. Clearly, other studies are needed that examine issues of the validity of self-reported data on health insurance. The findings presented here suggest that great caution should be used in interpreting self-reported information from individuals about the basic characteristics of their health insurance other than presence or absence of insurance. However, collecting such data from administrative databases can be expensive and time-consuming and often is not representative. To obtain accurate information about the fundamental characteristics of health insurance in the United States, private health organizations and the public sector must find innovative ways to collaborate and share data. □

## Contributors

D. E. Nelson and B. L. Thompson planned the study and wrote the paper. N. J. Davenport and L. J. Penaloza collected the data and contributed to the study design and to the writing of the paper.

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