

Response Error in Reporting Dental Coverage by Older Americans in the Health and Retirement Study

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Abstract

The aim of this research was to analyze the inconsistency in responses to survey questions within the Health and Retirement Study (HRS) regarding insurance coverage of dental services. Self-reports of dental coverage in the dental services section were compared with those in the insurance section of the 2002 HRS to identify inconsistent responses. Logistic regression identified characteristics of persons reporting discrepancies and assessed the effect of measurement error on dental coverage coefficient estimates in dental utilization models. In 18% of cases, data reported in the insurance section contradicted data reported in the dental use section of the HRS by those who said insurance at least partially covered (or would have covered) their (hypothetical) dental use. Additional findings included distinct characteristics of persons with potential reporting errors and a downward bias to the regression coefficient for coverage in a dental use model without controls for inconsistent self-reports of coverage. This study offers evidence for the need to validate self-reports of dental insurance coverage among a survey population of older Americans to obtain more accurate estimates of coverage and its impact on dental utilization.

Keywords

dental insurance, dental coverage, measurement error, dental use, consistent response

Introduction

Response variance or unreliability is introduced in surveys when sampled individuals provide different answers to the same question asked more than once in the survey. Response variance is only one example of measurement errors in surveys.¹ The presence of measurement error from inconsistent or unreliable reporting of the explanatory variables in a regression model poses estimation problems that may cause potentially downward biased, inconsistent estimates of the regression coefficients.^{2,3}

Previous studies have addressed disagreements between survey measurements of public and private health insurance coverage from alternate sources for nonelderly populations. Black et al estimated a 34% downward bias in a wage growth model for the health insurance coefficient from using employee reports of group health insurance coverage instead of the 79% of employee responses that agreed with the employer verification of coverage status.⁴ Hill used up to four sources of data including insurance cards, policy booklets, medical providers, and employers and insurance companies, to verify self-reports of health insurance coverage status for 97% of household members in the 1996 Medical Expenditure Panel Survey (MEPS).⁵ Call et al estimated from the 2004 Medicaid Undercounts Experiments (MUE)

data that between 13% and 20% of surveyed known Medicaid beneficiaries across three states reported no Medicaid coverage at all while 3% to 13% of them in these states reported no coverage from any source.⁶

Cafferata verified 70.9% of self-reports of dental service coverage by elderly household members 65 and older against policy documentation collected from employers and insurance providers in the 1977 National Medical Care Expenditure Survey (NMCES). Of the 8.8% self-reporting dental coverage in the household survey, 40% lacked validated coverage. Correct household survey responses were (1) correlated positively with household income and negatively with a person's age, and (2) were more prevalent among whites than non-whites and among those with Medicare and private insurance than other medical insurance coverage.⁷

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A longitudinal survey of older Americans over 50 years of age was used in our study to identify response inconsistency to survey questions regarding insurance coverage of dental services. In each of four recent waves of the survey administered at 2-year intervals between 2002 and 2008, individuals were asked about dental coverage associated with their use of dental services. Those who did not use dental services were queried as to whether services would have been covered by insurance. In Wave 6 covering the survey period 2000 to 2002, respondents were also asked in a separate section of the survey if they had any dental insurance. Recent studies of dental use and coverage using these data relied solely on questions regarding dental coverage available only in the dental use section of the survey.⁸⁻¹⁴ Our preliminary estimates showed disproportionately higher rates of coverage than expected among certain population subgroups of non-users of dental services in the data used for these studies. This suggested that certain groups of older Americans might mistakenly believe that Medicare covered dental services. However, Medicare does not routinely cover dental care with the exception of a small but growing percentage of beneficiaries in Medicare Advantage programs who may or may not receive this coverage.¹⁵⁻¹⁸

In our study, persons with response inconsistencies and their personal characteristics are identified, and the impact of estimates of dental coverage on the likelihood of dental use with and without controls for potential errors in measuring dental coverage is analyzed. Response errors in reporting dental coverage are hypothesized as follows: (1) to not be equally distributed across population groups, (2) to be higher among non-users of dental services, and (3) to deflate estimates of dental coverage in dental use regression models.

Methods

The Health and Retirement Study (HRS) is a nationally representative longitudinal household survey in the United States that collects self-reported data from interviews with individuals over age 50 and their spouses every 2 years. We use the 2002 (Wave 6) installment of the HRS for our study containing 18 469 sampled individuals. Administered by the Institute for Social Research (ISR) at the University of Michigan and sponsored by the National Institute on Aging, the HRS is useful for the study of aging, retirement, and health among older populations in the United States.^{19,20} Each respondent is asked a large battery of questions including information about demographics; income and assets; physical and mental health; cognition, family structure, and social supports; health care utilization and costs; health insurance coverage; labor force status and job history; and retirement planning and expectations. Because of the breadth of data available across health and labor force measures and the large sample of older Americans, the HRS is an excellent data source for assessing the association between dental coverage, use, and retirement among an older population.

This analysis focuses on the consistency of self-reported dental insurance coverage in the HRS. In 2002, dental coverage was determined in the survey three possible ways: (1) Persons who visited the dentist for dental care at least once during the 2-year period prior to the survey were classified as covered if they reported that their expenses were covered completely, mostly, or partially by insurance; (2) persons not visiting the dentist were considered to have dental coverage if they reported that insurance would have covered any of their expenses had they visited the dentist; and (3) finally, in the insurance section of the questionnaire, all persons were asked directly whether they had any insurance covering dental bills. Those answering *yes* were asked if they had coverage from one of the plans previously described or a different plan. If using a previous plan, they were asked to identify which plan.

We identify persons with inconsistent reports of dental coverage in Wave 6 as those who reported having coverage in (1) or (2) above but not having coverage in (3) above. Persons reporting coverage in (1) or (2) but reporting dental coverage from Medicare in (3) are also classified as inconsistent cases, although any persons in Medicare Advantage plans offering dental coverage could potentially be misclassified as inconsistent cases. Persons reporting coverage in (2) but who were unable to answer the direct insurance question in (3) or questions regarding the plan or type of plan offering them coverage are also classified as inconsistent cases. Persons reporting no dental coverage by either (1) or (2) who reported dental coverage in (3) from a private plan, Medicaid, Champus, a previous plan not on the list, or a different plan not previously mentioned are also classified as inconsistent cases.

Survey respondents are designated as fully retired if at the time of the survey interview they were not working for pay or self-employed and either (1) said that they were completely retired or (2) reported their sole employment status as retired. Individuals are classified as partially retired if they were not fully retired but report retirement and either working or looking for work. Individuals not classified as fully or partly retired are designated as in the labor force if they report working for pay or report their labor force status as working full-time, part-time, or unemployed. Persons are classified as not retired and out of the labor force if they report being disabled, not in the labor force or never in the labor force.

The wealth measure we use is the total net value of wealth including the net value of any secondary residence owned by the household. The HRS collects data on separate components of wealth and debt and then sums them to produce a total net value of wealth. Responses are bracketed for cases in which respondents cannot provide exact data to improve the accuracy of imputed values.²⁰⁻²²

We calculate Z tests for the differences between mean percentages reporting consistent and inconsistent dental coverage for specific population subgroups defined by selected

individual and household characteristics. We also estimate a logistic regression model of the likelihood of inconsistently reporting dental coverage as a function of these same person-level and household characteristics. Finally, we estimate separate logistic models of dental service use with and without controls for inconsistent reporting of dental coverage and with controls for other potentially confounding variables including age, sex, race/ethnicity, education, marital status, household size, health status, body mass index, household income, household wealth, Census region, and retirement/labor force status.

The HRS core sample design is a multistage area probability sample of households, so all estimates and statistics reported were computed taking into account this design with the use of the software packages SUDAAN and STATA.^{23,24} Unless otherwise stated, all reported results are significant at the .05 level.

Results

Inconsistent Cases

In Table 1, we show for Wave 6 how we classified persons reporting their dental coverage status in the dental use section of the survey as consistent or inconsistent reporting based on their responses in the insurance section of the survey.

Notably in Table 1, 1111 or 18.1% of the 6144 persons reporting coverage in the dental use section were classified as inconsistent cases. The inconsistent rates for those reporting coverage were higher for those non-users answering positively to the hypothetical coverage question (30%) compared with users saying that dental insurance at least partially covered their dental services (14%). One-fifth of all inconsistently reported dental coverage cases reported Medicare as their coverage source with a slightly higher rate reported among non-users (23%) than users (17%) of dental services. Of the 10 013 reporting no dental coverage in the dental use section of the survey, only 241 or 2.4% reported contradictory responses in the insurance section.

Personal Characteristics

Tables 2 and 3 highlight the personal and household attributes distinguishing persons reporting dental coverage consistently in each section of the survey from those who report contradictory information in the two sections of the survey. In Table 2, comparisons are made between consistent and inconsistent reporters of dental coverage across covariates, whereas in Table 3, logistic regression estimates of characteristics of inconsistent reporters are provided that were adjusted by controls for other covariates.

Unadjusted results. In Table 2, persons reporting dental coverage inconsistently can be generally characterized as aged 65

to 69; Hispanic or black, non-Hispanic; not a high school graduate; not married; in fair or poor health; living in poor, low income, lowest wealth households not of size 2; and fully retired with a relatively high number of chronic conditions. They are also characterized as persons with a relatively high number of difficulties with activities of daily living (ADLs).

Adjusted results. The logistic regression results in Table 3 confirm that persons reporting dental coverage inconsistently are more likely to be black, non-Hispanic than white, non-Hispanic; fully retired, partly retired, or not retired and not in the labor force than not retired and in the labor force; living in households not in the highest wealth decile; and having more rather than fewer difficulties with ADLs. We also found them more likely to be aged 65 to 69 than under age 65; other, non-Hispanic than white, non-Hispanic; divorced, separated, or never married than married; and living in the northeast Census region rather than in the southern region. Influences of education, household size and income, and health status and number of chronic conditions from the unadjusted results were not found after controls were introduced in the logistic regressions.

Dental Use

In Table 4, we show the influence of controlling for inconsistent reporting of dental coverage on coefficient estimates of dental coverage in logistic regressions of the likelihood of dental use.

Baseline estimates without controls. We first ran the model with no controls for quality of reporting coverage. Coverage is based on responses to the dental use questions in the survey as defined in (1) and (2) in the Methods section. Next we ran the same model only dropping the 1352 persons we classified as having potential measurement error in reporting coverage. Not unexpectedly, the logistic coefficient and the point estimate of the adjusted odds ratio for dental coverage both increased after dropping sample observations with potential measurement error.

With controls for quality of reporting. We next estimated the dental use model with the full sample and including controls for the potential measurement error in reporting coverage or no coverage in the dental use section of the survey. We ran the model twice. In the first case, the reference group contained persons reporting coverage in the dental use section contradicted by their responses in the insurance section. In this model, those reporting dental coverage without error are more likely to use dental care than those reporting coverage with error. Those reporting no coverage without error are less likely to use dental care than those reporting coverage with error. Those persons reporting no dental coverage in the dental use section and conflicting data in the insurance section are no more likely to use dental care than the reference group.

Table 1. Consistency of Dental Coverage Reporting, US Civilian, Non-institutionalized Population: Health and Retirement Study.

2000-2002 HRS survey		
Coverage status from dental use questions ^a	Coverage status from insurance questions ^b	Sample size (%) ^c
Inconsistent reporting of coverage from dental use questions		
Dental use at least partially covered	Covered by Medicare	106 (1.7)
	No coverage	504 (8.2)
No dental use but coverage if used	Covered by Medicare	114 (1.9)
	No coverage	356 (5.8)
	Unknown, refused	31 (0.5)
	Total	1111 (18.1)
Consistent reporting of coverage from dental use questions		
Dental use at least partially covered	Private plan	1788 (29.1)
	Public plan not Medicare	121 (2.0)
	Different plan not previously described	1880 (30.6)
	Unknown, refused	47 (0.8)
No dental use but coverage if used	Private plan	654 (10.6)
	Public plan not Medicare	108 (1.8)
	Different plan not previously described	432 (7.0)
	Missing	3 (0.0)
	Total	5033 (81.9)
Inconsistent reporting of no coverage from dental use questions		
Dental use not even partially covered	Private plan	101 (1.0)
	Public plan not Medicare	9 (0.1)
	Different plan not previously described	60 (0.6)
No dental use and no coverage if used	Private plan	50 (0.5)
	Public plan not Medicare	4 (0.0)
	Different plan not previously described	17 (0.2)
	Total	241 (2.4)
Consistent reporting of no coverage from dental use questions		
Dental use not even partially covered	Medicare	25 (0.2)
	No coverage	4893 (48.9)
	Unknown, refused	31 (0.3)
No dental use and no coverage if used	Medicare	16 (0.2)
	No coverage	4735 (47.3)
	Unknown, refused	72 (0.7)
	Total	9772 (97.6)

Note. Data are based on a sample of 16 157 persons 55 and older without missing person-level weights or missing values of any of the analytic variables in the study. HRS = Health and Retirement Study.

^aResponses to questions HNI64, HNI65, and HNI72: (1) In the last 2 years, have you seen a dentist for dental care, including dentures? If so, (2) were your dental expenses completely covered by insurance, mostly covered, only partially covered, or not covered at all by insurance? If not (3) if you did need to see a dentist, would you expect any of the costs to be covered by insurance?²⁵

^bResponses to questions HN067 to HN069: (1) Do you have any insurance that covers dental bills? (2) Is that one of the plans you have already described or a different plan? If a previously described plan, (3) which plan is that?²⁵

^cPercent of the total (6144) reporting dental coverage in the dental use section for those with consistent or inconsistent coverage reporting or percent of the total (10 013) reporting no dental coverage in the dental use section for those with consistent or inconsistent reporting of no dental coverage.

In the second case, we ran the same model and we specified only persons reporting lack of dental coverage without evidence of measurement error as the reference group. Notably in this model, the estimated impact of dental coverage on the likelihood of dental use for those reporting without potential measurement error is similar in magnitude to that of the baseline case with potential measurement error cases removed from the regression. Both cases show over a

10% downward bias from response error (ie, a coefficient of .83 in the error-prone models as compared with .95 or .93 in the models that control for inconsistent responses). We also find that persons reporting dental coverage in one section of the survey but not the other are also more likely to use dental care than those reporting lack of dental coverage in both sections. This positive effect of “half-reported” dental coverage on dental use from above is less than the impact of

Table 2. Consistency of Dental Coverage Reporting by Population Characteristic, US Civilian Non-institutionalized Population: 2000-2002 HRS.

Population characteristic	Subgroup Size	Population size (1000s)		
		Total	Consistent reporting	Inconsistent reporting
		59 219	54 538	4681
			% of column total	
Total		100	100	100
Age (years)				
55-64	25 564	43.17	43.56*	38.63
		0.76	0.82	1.90
65-69	9429	15.92	15.59*	19.74
		0.34	0.34	1.12
70-74	8473	14.30	14.15	16.18
		0.36	0.38	1.14
75-79	7039	11.89	11.97	10.96
		0.42	0.46	0.99
80-84	5273	8.9	8.98	7.99
		0.32	0.35	0.82
85 and older	3441	5.81	5.75	6.50
		0.24	0.24	0.59
Sex				
Female	32 603	55.06	54.88	57.13
		0.40	0.42	1.38
Male	26 616	44.94	45.12	42.87
		0.40	0.42	1.38
Race/ethnicity				
Black, non-Hispanic	5269	8.90	8.26*	16.31
		0.54	0.54	1.22
Hispanic	3667	6.19	5.90*	9.63
		0.96	0.98	1.15
White, non-Hispanic	48 988	82.72	83.76*	70.66
		1.15	1.15	1.73
Other, non-Hispanic	1295	2.19	2.08	3.40
		0.32	0.29	0.88
Education				
Some or no school	13 365	22.57	21.92*	30.14
		0.79	0.83	1.73
High school graduate	33 642	56.81	57.22*	52.02
		0.65	0.67	1.61
College graduate	12 213	20.62	20.86	17.84
		0.88	0.91	1.25
Marital status				
Married	38 047	64.25	65.05*	54.84
		0.62	0.61	1.94

(continued)

Table 2. (continued)

Population characteristic	Subgroup Size	Population size (1000s)		
		Total	Consistent reporting	Inconsistent reporting
		59 219	54 538	4681
		% of column total		
Divorced/separated	6889	11.63	11.25*	16.04
		0.41	0.41	1.48
Widowed	12 372	20.89	20.65*	23.72
		0.42	0.44	1.24
Never married	1911	3.23	3.04*	5.40
		0.18	0.20	0.70
Household size				
One	13 833	24.32	24.03*	27.71
		0.46	0.43	1.51
Two	31 360	55.12	55.73*	48.0
		0.65	0.65	1.47
Three or more	11 698	20.56	20.25*	24.29
		0.69	0.70	1.42
Health status				
Excellent/very good	24 891	42.03	42.54*	36.10
		0.69	0.71	1.77
Good	18 678	31.54	31.78	28.71
		0.52	0.53	1.53
Fair/poor	15 651	26.43	25.68*	35.20
		0.60	0.60	1.73
Body mass index				
Underweight (<18.5 kg/m ²)	1174	1.98	1.98	1.96
		0.11	0.12	0.36
Normal (18.5-24.9 kg/m ²)	19 970	33.72	33.83	32.42
		0.58	0.59	1.47
Overweight (25.0-29.9 kg/m ²)	23 182	39.15	39.29	37.52
		0.41	0.43	1.53
Obese (≥30 kg/m ²)	14 893	25.15	24.90*	28.11
		0.51	0.53	1.53
Household income ^a				
Poor	4594	8.07	7.50*	14.81
		0.46	0.47	1.36
Low income	9805	17.24	16.84*	21.94
		0.51	0.54	1.53
Middle income	17 812	31.31	31.62*	27.61
		0.79	0.83	1.55
High income	24 679	43.38	44.04*	35.64

(continued)

Table 2. (continued)

Population characteristic	Subgroup Size	Population size (1000s)		
		Total	Consistent reporting	Inconsistent reporting
		59 219	54 538	4681
		1.13	1.22	1.96
Household wealth decile			% of column total	
1-3	14 646	25.74	24.48*	40.60
		0.89	0.89	2.12
4-6	16 840	29.60	29.87*	26.45
		0.70	0.76	1.54
7-9	18 728	32.92	33.55*	25.45
		0.86	0.87	1.59
10	6676	11.74	12.09*	7.50
		0.55	0.58	0.85
Region				
Midwest	15 174	25.62	26.21*	18.76
		1.66	1.71	1.64
Northeast	10 626	17.94	17.46*	23.63
		1.63	1.71	1.95
South	21 955	37.07	37.06	37.19
		1.46	1.52	2.27
West	11 465	19.36	19.27	20.43
		1.69	1.68	2.38
Retirement/labor force status				
Fully retired	27 976	47.24	46.76*	52.89
		0.62	0.69	1.86
Partly retired	5034	8.50	8.55	7.97
		0.35	0.37	0.83
In the labor force, not retired	16 936	28.60	29.40*	19.27
		0.51	0.58	1.61
Not in the labor force, not retired	9273	15.66	15.30*	19.87
		0.57	0.60	1.43
Mean value for column population				
Number of difficulties with activities of daily living	59 219	0.30	0.28	0.52
		0.01	0.01	0.04
Number of chronic conditions	59 219	1.86	1.85*	2.06
		0.02	0.02	0.05

Note. Data are based on a sample of 16 157 persons from the 2002 HRS who were 55 and older, with positive-valued weights, and without any missing data. Rounding accounts for any column sums is not equal to totals. Persons were not asked the question about missing permanent teeth in the 2002 HRS. Standard errors appear beneath estimates in the shaded rows of the table. HRS = Health and Retirement Study; ref. = reference group.

^aLow income refers to persons in families with incomes 101% to 199% of the poverty line; middle income, 201% to 400% of the poverty line; and high income, over 400% of the poverty line. Poor persons are at or below 100% of the poverty line including persons in families with a negative income.

*This indicates that the mean in the column is significantly different from those reporting dental coverage or lack of dental coverage inconsistently between the dental use and insurance sections of the HRS survey, $P \leq .05$.

Table 3. Adjusted Odds Ratios From Logistic Regression Comparing Participant Variables of Interest by Consistency of Self-Reported Dental Coverage: HRS, 2000-2002, United States.

Population characteristic	Likelihood of inconsistent reporting
Age (years)	
55-64 (ref.)	1.00
65-69	1.29** [1.10, 1.52]
70-74	1.12 [0.90, 1.40]
75-79	0.90 [0.71, 1.15]
80-84	0.84 [0.63, 1.12]
≥85	0.90 [0.72, 1.13]
Gender	
Male (ref.)	1.00
Female	0.94 [0.83, 1.07]
Race/ethnicity	
Black, non-Hispanic	1.68** [1.33, 2.12]
Hispanic	1.36 ^b [0.99, 1.87]
White, non-Hispanic (ref.)	1.00
Other, non-Hispanic	1.54* [1.10, 2.14]
Education	
Some or no school	0.90 [0.71, 1.15]
High school graduate	0.89 [0.75, 1.06]
College graduate (ref.)	1.00
Marital status	
Married (ref.)	1.00
Widowed	1.18 [0.93, 1.49]
Divorced/separated	1.41* [1.02, 1.95]
Never married	1.79** [1.26, 2.53]
Household size, number of persons	
1 (ref.)	1.00
2	1.12 [0.92, 1.37]
≥3	1.27 ^b [0.99, 1.63]
Health status	
Excellent or very good (ref.)	1.00
Good	0.90 [0.75, 1.08]
Fair or poor	0.97 [0.80, 1.18]
Body mass index	
Underweight (<18.5 kg/m ²)	0.87 [0.55, 1.35]
Normal (18.5-24.9 kg/m ² ; ref.)	1.00
Overweight (25.0-29.9 kg/m ²)	0.99 [0.85, 1.16]
Obese (≥30 kg/m ²)	1.06 [0.89, 1.26]
Household income^a	
Poor	1.15 [0.86, 1.54]
Low	0.99 [0.78, 1.24]
Middle	0.85 [0.69, 1.06]
High	1.00
Household wealth decile	
1-3	2.03** [1.46, 2.83]
4-6	1.44* [1.05, 1.99]
7-9	1.28 ^b [0.99, 1.66]
10 (ref.)	1.00
Region	
Midwest	0.86 [0.69, 1.07]
Northeast	1.50** [1.12, 2.00]

(continued)

Table 3. (continued)

Population characteristic	Likelihood of inconsistent reporting
South (ref.)	1.00
West	1.23 ^b [0.97, 1.55]
Retirement or labor force status	
Fully retired	1.70** [1.37, 2.11]
Partly retired	1.47* [1.08, 2.01]
In the labor force, not retired (ref.)	1.00
Not in the labor force, not retired	1.71** [1.28, 2.27]
Number of difficulties with activities of daily living	1.16** [1.07, 1.24]
Number of chronic conditions	1.00 [0.95, 1.04]

Note. Data are based on a sample of 16 157 persons with dental use who were 55 years and older and without missing person-level weights or missing values of any of the analytic variables in the study from Wave 6 of the HRS. 95% confidence intervals are in brackets. The adjusted value refers to the inclusion in the regression of the control variables listed in the rows of the table. For continuous covariates, the adjusted odds ratio point estimate was derived from a one-unit change in the variable. HRS = Health and Retirement Study; ref. = reference group.

^aLow income refers to persons in families with incomes 101% to 199% of the poverty line; middle income, 201% to 400% of the poverty line; and high income, >400% of the poverty line. Poor persons are at or below 100% of the poverty line, including persons in families with negative incomes.

^bApproached statistical significance at $P < .1$.

* $P \leq .05$. ** $P \leq .01$.

error-less reported coverage in one case, but is statistically equivalent for persons reporting no dental coverage in the use section of the survey and coverage in the insurance section. The latter result was confirmed in a separate regression not shown in Table 4 with persons reporting no coverage in the use section and coverage in the insurance section as the reference group.

Discussion

In summary, our study estimated an 18% rate of inconsistent reporting by persons reporting dental coverage in the dental use section of the Wave 6 2002 HRS. The rate was considerably higher among non-users of dental services (30%) in response to a hypothetical question regarding coverage if services had been used compared with users of dental services who said that dental insurance had at least partially covered their dental care (14%). We also found distinct characteristics of persons more likely to provide potentially erroneous coverage status based on their retirement, wealth, health, and marital status as well as their race/ethnicity. These individuals are characterized as black or other non-Hispanics; not in the labor force; aged 65 to 69; never married, divorced, or separated; with higher numbers of difficulties with ADLs, living in households in the Northeast

Table 4. Logistic Regression Models of Dental Use With and Without Controls for Inconsistent Reporting of Dental Coverage: HRS, 2000-2002, United States.

Model	Logistic coefficient (SE)	Adjusted odds ratio (95% CI)
Baseline without controls for inconsistent reporting		
Dental coverage	0.83** (0.05)	2.29** [2.07, 2.53]
No dental coverage (ref.)	0	1.00
Baseline without controls for inconsistent reporting excluding persons with inconsistent reporting ^a		
Dental coverage	0.95** (0.05)	2.58** [2.33, 2.86]
No dental coverage (ref.)	0	1.00
With controls for inconsistent reporting		
Consistent reporting of dental coverage	0.35** (0.08)	1.43** [1.21, 1.67]
Consistent reporting of no dental coverage	-0.58** (0.09)	0.56** [0.47, 0.67]
Inconsistent reporting of no dental coverage ^b	0.23 (0.19)	1.25 [0.86, 1.83]
Inconsistent reporting of dental coverage ^c (ref.)	0	1.00
With controls for inconsistent reporting		
Consistent reporting of dental coverage	0.93** (0.05)	2.54** [2.29, 2.81]
Inconsistent reporting of dental coverage ^c	0.58** (0.09)	1.78** [1.49, 2.12]
Inconsistent reporting of no dental coverage ^b	0.80** (0.16)	2.23** [1.62, 3.07]
Consistent reporting of no dental coverage (ref.)	0	1.00

Note. Data are based on a sample of 16 157 persons 55 and older without missing person-level weights or missing values of any of the analytic variables in the study from Wave 6 of the HRS. The adjusted value refers to the inclusion in the regression of all the other variables listed in the rows of Table 3. HRS = Health and Retirement Study; SE = standard error; CI = confidence interval; ref. = reference group.

^aThis was based on a sample of 14 805 persons after removing 1352 persons with inconsistent reporting of dental coverage.

^bReported no dental coverage from the dental use questions and dental coverage from the insurance questions.

^cReported dental coverage from the dental use questions and no dental coverage from the insurance questions.

** $P \leq .01$.

Census region, and with relatively low levels of household wealth. Finally, estimates of the effect of dental coverage on the likelihood of dental use were deflated by as much as 13% without controlling for potential response errors.

Although not reported in our study, we also analyzed inconsistent reporting of dental coverage in Wave 10 of the HRS covering the survey period 2008 to 2010 because dental insurance data were collected in the insurance section the same as was done in Wave 6.^{25,26} However, the hypothetical question regarding coverage for non-users was no longer asked in the dental use section of Wave 10. Therefore, we were unable to estimate dental use models as in Table 4 because we only had inconsistent reports by dental users. We did find that the inconsistent reporting rate for dental users from Wave 10 (16%) was comparable with our finding from Wave 6 (14%).

Our study is limited because we did not have a validation measure of dental coverage. Instead we relied solely on self-reports to measure response errors (ie, reliability) rather than verified proof from policy booklets or follow-back surveys of insurance providers (ie, the validity of the responses). As such, our 14% to 16% inconsistent rate for self-reports of dental coverage by 2002 HRS dental users is not strictly comparable with the 40% invalidation rate from the aforementioned 1977 NMCES study and could be even higher with similar validation.⁷ Apart from the considerably lower rate of self-reported dental coverage by the elderly in the NMCES sample (8.8%) compared with our HRS sample

(38%), our studies also differed by the inclusion of near-elderly persons aged 55 to 64 in our study.

We note that our measure of inconsistent reporting is not without error. We may have misclassified cases in which a person may have coverage for a subset of procedures but not for the dental services provided during the survey period (ie, reported no coverage associated with use but dental coverage in the insurance section of the survey and therefore was identified as a false “no coverage”). We assumed that those reporting Medicare as their dental coverage source did not realize that their coverage does not include dental benefits, yet some of them may in fact have been in a Medicare Advantage plan that does cover dental services (resulting in falsely labeling some portion of the 20% of individuals reporting Medicare as their dental insurance source as inconsistent “covered” respondents). In 2002, however, only 14% of Medicare beneficiaries were in these plans.¹⁵

The findings suggest that, as in the previous literature,² the presence of measurement error among right-hand side variables results in the attenuation of coefficients in regression models. While we can only speculate on which responses are correct among those who are inconsistent, we suspect that the question wording related to coverage associated with dental use may inflate the assertion of coverage. The question wording asks, “Were your dental expenses completely covered by health insurance, mostly covered, only partially covered, or not covered at all by insurance?” Although the wording includes “not covered at all” as a response choice,

the presupposition in the wording may suggest to the respondent an expectation of insurance coverage. It would be interesting to see if wording that asks respondents simply who covered the costs would decrease the inconsistency in the reports of coverage.

Authors' Note

Copies of computer data analyses may be made available from the authors on request.

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