Analysis of Medicare Beneficiary Baseline Knowledge Data from the Medicare Current Beneficiary Survey

Knowledge Index Technical Note

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Executive Summary

As the number and range of options open to Medicare beneficiaries increase, it is of vital importance that beneficiaries sufficiently understand their insurance options and plan coverage so they can make informed choices. However, recent studies have shown that Medicare beneficiaries possess a low level of understanding about their health care coverage. The National Medicare Education Program (NMEP) is the Health Care Financing Administration's (HCFA's) coordinated effort to educate beneficiaries by developing informational resources and by informing beneficiaries about and motivating them to use these resources.

The Medicare Current Beneficiary Survey (MCBS) provides a useful source of existing data that can be used to assess the impact of the NMEP interventions on levels of Medicare beneficiary knowledge. Using data from the 1995, 1996, 1997, and 1998 waves of the MCBS, six different measures of knowledge were created.[1] The first measure is a single question that assesses the understandability of the Medicare program and the second measure is a global question of whether beneficiaries' feel they know everything they need to know about Medicare. The third measure, the know-all-need-to-know index, combines respondents' answers concerning the adequacy of their knowledge of five different aspects of the Medicare program. The other three measures are quizzes (the three-item quiz, the four-item quiz, and the eight-item quiz) that contain true/false questions about the Medicare program. The respondent's quiz score is the number of questions he/she answered correctly.

The knowledge scales were evaluated on several different criteria, including internal consistency reliability and construct validity. Construct validity was evaluated using two methods: (1) comparisons among known groups, and (2) correlations with other knowledge scales. Table ES-1 summarizes the performance of the six knowledge scales with respect to these criteria. A notation of "+" indicates that the scale reached acceptable levels for the criterion, while a "–" indicates that the scale did not perform acceptably on the criterion.

The results of the comparisons among known groups indicate that the Medicare understandability question demonstrates evidence of construct validity. Respondents who were expected to have higher knowledge of Medicare were more likely to respond that the Medicare program is understandable. There are, however, various limitations in using this global question to measure beneficiary knowledge. First of all, this question was not correlated with the other knowledge scales, suggesting that it may be measuring a different construct. Next, the question provides only two response alternatives (yes or no), limiting the precision with which differences among groups or change within groups can be described. Also, because this is only a single item, it can provide only a limited amount of information. For example, in 1995, approximately

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[1] A seventh possible measure, the need-for-information index, was analyzed and found to be inappropriate as a measure of knowledge. A description and outline of the results of the analyses on the need-for-information index are presented in Appendix B.

30% of beneficiaries indicated that they felt that the Medicare program was not understandable. However, this does not provide information on what specific areas of Medicare the respondents did not understand.

Table ES-1. Psychometric Properties of Knowledge Scales

Knowledge Scale	Internal Consistency Reliability	Validity – Known Groups Comparisons	Validity – Correlations with Other Scales
Medicare understandability question	N/A	+	—
Global know-all-need-to-know question	N/A	+	+
Four-item quiz	+	+	+
Three-item quiz	—	+	+
Eight-item quiz	+	+	+
Know-all-need-to-know Index	+	+	+

Note: A notation of "+" indicates that the scale met the acceptable level for this criterion, and a "-" denotes the failure of the scale to reach an acceptable level. The small "+" for the four-item quiz indicates that this scale has an alpha lower than 0.70, which is often used as a rule of thumb for acceptable internal consistency. However, the scale has an alpha greater than 0.50, which may be considered promising internal consistency for a scale under development.

The global know-all-need-to-know question also performed well on the known-groups validity analyses. Those who were expected to have more knowledge received higher scores on this question than those who were expected to have lower knowledge levels. In contrast to the Medicare understandability question, this question was correlated with the know-all-need-to-know scale and the eight-item quiz, suggesting that it is measuring the same underlying construct. However, this question has the same limitations as the Medicare understandability question in that it is only one item and therefore can provide only a very limited amount of information.

The know-all-need-to-know scale performed very well on all of the psychometric analyses, demonstrating high levels of internal consistency reliability and acceptable validity. However, one concern with using the know-all-need-to-know scale to measure knowledge is that this scale relies on individual self-report of knowledge rather than actually requiring beneficiaries to demonstrate that they do in fact have knowledge of the Medicare system. Therefore, the know-all-need-to-know scale may be measuring some other construct (e.g., perception of knowledge) rather than actual level of knowledge. For example, individuals who are overly confident or less likely to admit that they do not understand a topic may report knowing everything they need to know regardless of their actual knowledge levels.

The three true/false quizzes (three-item quiz, four-item quiz, and eight-item quiz) avoid this limitation. These quizzes are closer approximations of beneficiary knowledge than either the Medicare understandability question or the know-all-need-to-know index because they require respondents to demonstrate knowledge by selecting the correct response to a question.

Both the three-item quiz and four-item quiz performed well on the validity analyses. The four-item quiz demonstrated acceptable reliability for a scale under development; however, the three-item quiz did not reach the acceptable level for reliability. A major limitation of these quizzes as measures of knowledge is the small number of items included on the quizzes. Because of this small number of items, the quizzes cannot cover all of the information that Medicare beneficiaries need to know in order to successfully negotiate the Medicare system. Also, there are only a small number of possible quiz scores, which does not give the quizzes much power to detect differences in knowledge. Furthermore, the internal consistency results suggested that increasing the number of items on the quizzes would increase the reliability of the scales. Therefore, it is recommended that additional items be added to these scales.

Of the six potential knowledge measures, the eight-item quiz provides the most precise indicator of beneficiary knowledge. The eight-item quiz performed well on all of the psychometric properties assessed here and is a direct measure of knowledge because it requires respondents to demonstrate their knowledge rather than simply reporting that they believe they have enough knowledge. In addition, the eight-item quiz has a larger number of items than the other quizzes, thereby increasing the range of possible scores and providing more power to discriminate among and within beneficiaries.

However, it should be noted that the item content of the quiz is somewhat limited and does not contain questions that address knowledge of the entire Medicare program. Rather, it appears to represent a sound measure of beneficiary knowledge of the Medicare managed care options. Increasing the number of items on the eight-item quiz would enhance the ability of the quiz to evaluate the entire domain of information that impacts beneficiaries' ability to make informed health care decisions. For example, items could be added that address knowledge of Medicare benefits as well as items on knowledge of the Medicare program structure and processes. A potential source for additional items is the knowledge index included in the *Medicare and You* evaluation.

1.0   The Need to Assess Medicare Beneficiary Knowledge

As the number and range of options open to beneficiaries in the Medicare program increase, it is of vital importance that beneficiaries sufficiently understand their insurance options and plan coverage so they can make informed choices. The National Medicare Education Program (NMEP) is the Health Care Financing Administration's (HCFA's) coordinated effort to educate beneficiaries by developing informational resources and by informing beneficiaries about and motivating them to use these resources.

Recent studies have shown that Medicare beneficiaries possess a low level of understanding about their health care coverage (Gibbs, Sangl, & Burrus, 1996; Hibbard, Jewett, Engelmann, & Tusler, 1998; Murray & Shatto, 1998; National Academy of Social Insurance [NASI], 1998). Many beneficiaries do not understand what services are covered or what plan options are available; many have never heard of a Medicare health maintenance organization (HMO); and the vast majority of individuals cannot identify basic distinctions between Original Medicare and Medicare managed care plans (Hibbard et al., 1998). Despite their admitted confusion about the Medicare program and covered services, beneficiaries report that they feel overwhelmed by the amount of information they already receive (NASI, 1998). As a result, it is imperative that Medicare beneficiary knowledge be assessed to help determine what important information beneficiaries lack so that the NMEP can target information dissemination to beneficiary needs.

The first step in determining the level of knowledge among Medicare beneficiaries is to develop an index that measures knowledge of the Medicare system. Therefore, the purpose of this report is the development of an index for measuring Medicare beneficiary knowledge. The Medicare Current Beneficiary Survey (MCBS) contains several questions that address topics related to knowledge of the Medicare system and can be combined to create various knowledge measures. In this report, data from the MCBS are used to evaluate the psychometric properties of each of these potential knowledge measures. Based on the performance of the measures, recommendations are made about the use of the knowledge indices for assessing beneficiary knowledge of the Medicare system.

2.0 Using the Medicare Current Beneficiary Survey to Assess Knowledge

The Medicare Current Beneficiary Survey (MCBS) provides a useful source of existing data that can be used to assess levels of Medicare beneficiary knowledge. The MCBS is a rotating panel design in which a large national probability sample of 14,000 or more Medicare beneficiaries is interviewed every 4 months for up to 4 years. Very old and disabled beneficiaries under age 65 have been over sampled for some rounds of the survey, as have beneficiaries enrolled in Medicare HMOs. Each year, approximately one quarter of the sample is rotated out of the survey and replaced with new sample members. Therefore, 25% of each annual MCBS data set represents a cross section of the Medicare population enrolled in the program continuously since January 1st of that year and 75% represents a longitudinal beneficiary panel.

This study focuses on the impact of the National Medicare Education Program (NMEP) interventions on beneficiary knowledge of Medicare. The NMEP interventions of immediate interest include the *Medicare and You* handbook (distributed in the five states in the fall of 1998 and distributed nationally in the fall of 1999), the *Medicare and You* bulletin (distributed in the remaining states in the fall of 1998), the Medicare beneficiary website (http://www.medicare.gov), and the toll-free national Medicare hotline [1-800-Medicar(e)]. Because the MCBS was conducted for a number of years before these NMEP activities were first implemented and will continue to be conducted in the future, it offers the opportunity to make longitudinal comparisons. For example, the MCBS makes it possible to (1) compare pre- to post-1998 changes in Medicare program knowledge for beneficiaries in the five states who received the NMEP *Medicare and You* handbook to those in the remaining states who received the *Medicare and You* bulletin in 1998, (2) track national trends in beneficiary knowledge and sources of information about Medicare through the periods in which NMEP activities were and will be implemented, and (3) monitor trends in beneficiaries success and preferences in using a variety of sources of information to stay informed about changes in the Medicare program.

However, the degree to which the MCBS supplies data about these NMEP interventions and their content varies with time. There are six different ways that beneficiary knowledge can be assessed using the MCBS from 1995 to 1998.[2] Table A-1 in Appendix A displays the questions for each of the possible knowledge measures. The first potential knowledge measure is a single question that assesses the understandability of the Medicare program that was administered in the MCBS during 1995, 1996, and 1997. Second, the 1998 (Round 24) MCBS included a global question on whether respondents felt they know everything they need to know regarding the Medicare program.

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[2] A seventh possible measure, the need-for-information index, was analyzed and found to be inappropriate as a measure of knowledge. A description and outline of the results of the analyses on the need-for-information index are presented in Appendix B.

Next, the 1996 (Round 18) and 1998 (Round 24) MCBS included five questions that may also be indicators for knowledge. Beneficiaries were asked how much they felt they knew about: (a) the Medicare program, (b) how much they have to pay for medical services covered by Medicare, (c) supplemental or Medigap insurance, (d) the availability and benefits of Medicare HMOs, and (e) choosing or finding a doctor or other health care provider.

The 1996 (Round 18) MCBS contained four additional questions that may also be a proxy for knowledge. These items comprise a true/false quiz that asks about whether Medicare pays for a flu shot or an annual physical examination. Two additional questions ask about how much doctors can charge when they accept assignment and what beneficiaries can do if they do not agree with a decision Medicare makes regarding a claim.

The 1998 (Round 24) MCBS contains a similar true/false quiz that may be used as a measure of knowledge. The quiz contains three questions concerning whether Medicare pays for colorectal cancer screening or flu shots and whether supplemental insurance is the same as a Medicare managed care plan.

Finally, an eight-item true/false quiz was included in the 1998 (Round 23) MCBS. The quiz contains eight statements about Medicare options and Medicare managed care plans to which participants responded true, false, or not sure.

3.0 Construction of the Knowledge Measures

3.1 Scoring Algorithms

3.1.1 Medicare Understandability Question

Affirmative ("Yes") responses to this question were coded as "1," while responses of "No" were coded as "0." Responses of "Don't Know," "Refused," and "Not Ascertained" were coded as missing. Higher scores on this question indicate that Medicare is understandable.

3.1.2 Global Know-All-Need-to-Know Question

The scoring of this question was reversed so that responses of "Just about everything I need to know…" were assigned a code of "5" and responses of "Almost none of what I need to know…" were scored as "1." Higher scores on this question indicate that the respondent perceived knowing more information about Medicare.

3.1.3 Know-All-Need-to-Know Index

The know-all-need-to-know index was created by reverse scoring each of the five response categories across the items. For example, in the original coding of the variables, knowing "Just about everything I need to know…" was coded as "1" and knowing "Almost none of what I need to know…" was coded as "5." The former response was recoded as "5" while the latter was recoded as "1." Responses for "2" and "4" were also switched. Responses were then summed.

If a respondent answered "3," "4," "2," "1," and "5" to the original questions, his knowledge score would be calculated as follows:

$$3 + 2 + 4 + 1 + 5 = 15.$$

Higher scores on this index reflect beneficiaries reporting that they knew as much as they needed to know for five different topics. This scoring system produces scores that may theoretically range from 5 to 25, thus providing greater variability in scores and more power to discriminate among and within beneficiaries.

One potential item regarding the Medicaid program was not included because it was only asked of Medicaid recipients.   Another item concerning staying healthy was excluded from the

calculation of the scale because this item does not address an insurance benefit or option and therefore conceptually appeared to be unrelated to the other five items[3].

Where data were missing, the know-all-need-to-know index was calculated by imputing values rather than altogether eliminating a respondent's answers. Imputation was only used for respondents who answered at least one half of the know-all-need-to-know items (three of the five items) by substituting the mean of the remaining items for the missing item values (Chapman, 1976). Individuals with missing responses for more than one half of the know-all-need-to-know items were assigned a value of missing for this index.

3.1.4 Four-Item Quiz

Correct responses to each of the four quiz questions were coded as "1," while all other responses (incorrect responses and don't know) were coded as "0." One potential quiz item addressing Medicare coverage for mammograms was excluded from the overall score calculation because it was only asked of women[4]. The recoded responses were then summed to create the quiz scores. For example, the score for a respondent who answered two quiz questions correctly would be calculated as

$$0 + 1 + 1 + 0 = 2.$$

An advantage of this scoring method is that it produces scores that have a meaningful interpretation, specifically, the number of questions for which the respondent knew the correct answer. Scores range from 0 to 4, with higher quiz scores reflecting more correct responses about Medicare coverage questions. Additionally, because males and females responded to the same items, it is appropriate to conduct gender comparisons using these scores.

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[3] Psychometric analyses were also conducted with this item included in the calculation of the know-all-need-to-know index. The results did not differ substantially from the results when the item was removed. Using the 1996 data, the coefficient alpha for sample members when the staying healthy item was included was 0.840 and when this item was excluded alpha was 0.839. Using the 1998 data, the alpha for sample members when the item was included was 0.825 and the value of alpha was 0.819 when the item was excluded.

[4] The quiz score was also calculated including the mammogram question. However, including this question did not substantially improve the psychometric properties of the quiz and calculating the scores including this question makes it inappropriate to use these scores to conduct gender comparisons. The coefficient alpha for female sample member respondents when the item was included was 0.58 and when it was excluded alpha was 0.52. Because men were not administered the mammogram question, the alpha for males did not change.

3.1.5 Three-Item Quiz

A similar scoring method was used for the three-item quiz as with the four-item quiz. A potential quiz question concerning Medicare coverage of mammograms was also excluded because it was asked only of women[5]. The responses to the three quiz questions were recoded so that correct responses were coded as "1" and all other responses (incorrect responses and don't know) were coded as "0." The quiz score was computed by summing the recoded responses to the three quiz questions. This produces a score representing the total number of questions answered correctly. For example, a respondent who had only one correct response and two incorrect responses received a score of 1 as follows:

$$1 + 0 + 0 = 1.$$

This scoring system produces scores ranging from 0 to 3 with higher scores indicating more knowledge of the Medicare program.

3.1.6 Eight-Item Quiz

The score for the eight-item quiz was created using a similar scoring method as the other two quizzes. Correct responses were given a score of "1," and incorrect responses were coded as "0." The recoded items were then summed to create an overall quiz score. For example, the score for a respondent who answered the first four items correctly and answered the last four incorrectly would be calculated as follows:

$$1 + 1+ 1+ 1 + 0 + 0 + 0 + 0 = 4.$$

This respondent would receive a quiz score of 4, indicating that four of the eight questions were answered correctly. With this scoring system, quiz scores can theoretically range from 0 to 8, with higher scores indicating higher levels of knowledge.

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[5] Analyses were also conducted including the mammogram score in the calculation of the quiz scores. Weighting was used to account for the difference in error variance for men and women due to the different number of items administered to the two groups. The results of the analyses indicate that including this item did not improve the psychometric properties of the scale enough to outweigh the drawbacks of including the item, namely the inability to make gender comparisons. With the extra item, the coefficient alpha for female sample members was 0.43 and without the extra item alpha was 0.54. Because men were not administered this extra item, the coefficient alpha for males did not change.

3.2 Psychometric Properties of Scale Scores

In this section, the psychometric properties of each of the six knowledge scales are described. First of all, for each scale, descriptive statistics were calculated to determine the most representative scores, the distribution of scores, and the percentage of missing data. Lack of variability in scores and high frequency of missing data compromise the validity of scale scores. Item-total score correlations corrected for overlap (Howard & Forehand, 1962) are examined to assess the relative contribution of each item to its scale.

The reliability of the scales was assessed using internal consistency. Internal consistency measures the degree to which items on a scale are related to each other and therefore appear to be measuring the same construct. The internal consistency reliability of all multi-item indices was estimated using Cronbach's alpha coefficient (Cronbach, 1951). A common rule of thumb is to require coefficients to be 0.70 and above in order for the index score to be considered reliable for use in group-level statistical analyses. However, this rule is sometimes relaxed to above 0.50 for new scales under development such as these knowledge indices (Helmstadter, 1966). The coefficient alphas for each index were also calculated separately for various subgroups. These analyses were useful for determining whether the index had different psychometric properties for different groups. If this were the case, it would not be appropriate to make group comparisons using the index because the results might be misleading.

Test-retest reliability was not assessed because this type of reliability is used to measure the stability of a scale over time and is usually assessed over a short period of time. The time between the administrations of the MCBS is relatively long (i.e., 1 year) during which several factors (e.g., experience with the program, use of services) could affect a respondent's level of knowledge. Calculating the test-retest reliability using assessments administered so far apart would greatly underestimate the reliability of the scales. Therefore, test-retest reliability is not an appropriate type of reliability assessment for the knowledge scales.

Next, construct validity was assessed by determining if scale scores discriminated among groups of Medicare beneficiaries who would be expected to differ in their knowledge of Medicare. Previous research provides the basis for determining which beneficiaries can be expected to have differing levels of knowledge. For example, factors related to socioeconomic status are often predictive of levels of insurance knowledge. Several studies report that respondents with more education have higher levels of insurance knowledge (Lambert, 1980; Marquis, 1983; McCall, Rice, & Sangl, 1986; Hibbard, Jewett, Englemann, & Tusler, 1998; McCormack, Garfinkel, Hibbard, Keller, Kilpatrick, & Kosiak, under review). Also, higher knowledge levels are associated with higher incomes (Lambert, 1980; Marquis, 1983; McCall et al., 1986; Hibbard et al., 1998) and having a supplemental insurance plan (Cafferata, 1984). Other sociodemographic factors associated with more knowledge include younger age (Lambert, 1980; Cafferata, 1984; McCall et al., 1986), being male (Lambert, 1980), being white (Marquis,

1983; McCall et al., 1986), and having better self-reported health status (McCormack, Ross, Daugherty, & Garfinkel, 2000).

Some research also suggests that service utilization is related to knowledge levels. Cafferata (1984) found that among a subsample of older adults with private insurance, service utilization was positively associated with knowledge. McCormack, Garfinkel, Hibbard, Keller, Kilpatrick, and Kosiak (under review) found that hospitalization and number of doctor visits were positively related to beneficiary knowledge of the Medicare system. Preliminary results from the National *Medicare & You* evaluation also suggest a positive relationship between beneficiary knowledge and number of doctor visits (McCormack et al., 2000).

Based on this previous research, it was expected that the following groups of beneficiaries would have higher levels of knowledge about the Medicare system:

- male beneficiaries,
- white beneficiaries,
- younger beneficiaries,
- beneficiaries with better self-reported health status,
- beneficiaries with higher incomes,
- beneficiaries with more education,
- beneficiaries with supplemental insurance, and
- beneficiaries with higher service utilization.

In this report, evidence for validity of a particular scale is provided if the results of the analyses on a particular knowledge scale showed these expected patterns.

Several background and experience variables were used for the validity analyses. First, respondents were compared on several demographic variables:

- gender (male vs. female),
- race (white vs. nonwhite),
- income (under $25,000 vs. $25,000 or more),
- age (under 65 years old, 65 to 75 years old, and over 75 years old),
- educational achievement (8th grade or less, more than 8th grade, but no college, and college), and
- self-reported health status (1 = "poor" to 5 = "excellent").

Respondents were also compared on these insurance-related variables:

- enrollment in managed care during the past year (enrolled or not enrolled),

- type of insurance (Medicare only, Medicare and private insurance, or Medicare and Medicaid/public insurance), and
- Medicare enrollment status (aged or disabled).

Next, possible differences in knowledge based on experience with the Medicare system were explored. Among aged beneficiaries, age was considered a proxy for experience with the Medicare system. Therefore, two groups of participants were created. Respondents who were 65 years old were considered new to the Medicare system, and participants who were older than 65 years of age were assumed to be experienced with the Medicare system. Because of the disproportionate number of respondents over 65 compared to the number of respondents exactly 65 years of age, 100 sample member respondents who were over 65 were randomly selected for comparisons with respondents who were 65 years old. Due to the very small number of proxy respondents who were exactly 65 years old, comparisons among proxy respondents were not conducted for this variable.

Because age may not be a precise measure of experience with the Medicare system, several other analyses were performed to examine possible differences using variables that approximate the amount of experience a respondent may have had with the Medicare system. Theoretically, individuals with more experience in the system should have more knowledge of Medicare. Two types of service utilization during the past year were included: (1) institutional utilization (some utilization or no utilization), and (2) Part B utilization (some utilization or no utilization). Also, the amounts of allowable and reimbursed charges were considered to be indicators of experience with the Medicare system. Specifically, the dollar amounts of total covered charges, total reimbursed dollars, and institutional charges were classified into four categories: (1) $0, (2) $1 to $499, (3) $500 to $4,999, and (4) $5,000 or more. Part B charges were also divided into four categories: (1) $0, (2) $1 to $499, (3) $500 to $1,499, and (4) $1,500 or more. Complete information on service utilization was only available for respondents who were not enrolled in an HMO. Therefore, our analyses of these variables include only individuals who were not enrolled in managed care during the year before the survey data were collected.

Because this was an elderly population whose members were likely to experience disabilities, the use of a proxy was sometimes necessary to obtain information on a respondent.[6] Therefore, for completeness, proxy information was included in these analyses. However, for each of these comparisons, data for sample members and proxy respondents were analyzed separately. It was expected that proxy and sample member participants would respond to the knowledge indices differently.

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[6] Proxy interviews comprised 12% of interviews in 1995, 11% of interviews in 1996 and 1997, and 10% of the interviews conducted in 1998.

3.2.1 Medicare Understandability Question

3.2.1.1 Descriptive Statistics. One possible measure of beneficiary knowledge about the Medicare system is the global question of whether Medicare is understandable. The frequency of responses to the Medicare understandability question are presented in Table 1. For each of the time points, the majority of respondents reported that the Medicare program is understandable. There were very few "not ascertained" responses, suggesting that missing data were not a threat to the validity of this measure.

Table 1. Frequency (and Percentage) of Responses to the Medicare Understandability Question

Interview Type/Survey Year	Yes	No	Don't Know or Refused[1]	Not Ascertained[1]
Sample Member Interviews				
1995 (Round 14)	8,097 (69.0%)	3,167 (27.0%)	462 (4.1%)	1 (0.0%)
1996 (Round 17)	8,878 (74.3%)	2,605 (21.8%)	47 (3.9%)	1 (0.0%)
1997 (Round 20)	9,467 (75.2%)	2,701 (21.5%)	422 (3.4%)	0 (0.0%)
Proxy Interviews				
1995 (Round 14)	1,103 (70.1%)	418 (26.6%)	53 (3.4%)	0 (0.0%)
1996 (Round 17)	1,088 (74.3%)	325 (22.2%)	50 (3.4%)	1 (0.1%)
1997 (Round 20)	1,167 (75.2%)	341 (22.0%)	43 (2.9%)	0 (0.0%)

[1]For the analyses, these responses were recoded as missing.

3.2.1.2 Reliability. Coefficient alpha for this question was not computed because this is a one-item scale. Therefore internal consistency is not relevant.

3.2.1.3 Validity. To evaluate the validity of this scale, chi-square tests were used to test if question value responses were dependent on group membership. The results of these analyses are presented in Tables A-2 through A-4 of Appendix A. Although results may vary from one time point to the next, the following are overall findings that appear to be consistent across the three time points.

Sample Member Interviews. First, respondents were compared on various demographic variables. Generally, the results indicate that the following groups were more likely to agree that the Medicare program was understandable:

- respondents with higher incomes,
- respondents with higher education,
- respondents with better self-reported health status,
- respondents who were eligible for Medicare because of their age,
- respondents who had been enrolled in managed care during the past year,

- respondents with Medicare and private insurance,
- respondents who were over 65 years of age,
- white respondents, and
- male respondents.

Beneficiaries' responses concerning the understandability of Medicare were also compared according to several variables related to use of health-related services. Complete service utilization data were available only for respondents who were not enrolled in managed care during the past year; therefore, only these respondents were included in the analyses using the service utilization variables. Respondents were compared according to whether they had any institutional utilization or Part B utilization during the past year. Overall, Part B and institutional utilization were significantly related to Medicare understandability. Respondents with some utilization were more likely than those with no utilization to report that Medicare was understandable.

Responses to the Medicare understandability question were also compared according to the amount of allowed and reimbursed charges the beneficiary incurred during the past year. For total covered charges, total reimbursed dollars, and allowed Part B charges, sample member respondents in the mid-to-high range of charges were more likely to report that Medicare was understandable than respondents with no charges or low charges. With respect to institutional charges, sample members with charges in the low-to-mid range reported greater Medicare understandability than those with no charges or high charges.

Proxy Interviews. In contrast to the results with sample member respondents, there were very few significant differences among proxy respondents with respect to the background and experience variables. None of these results was consistent across the three time points, suggesting that among the proxy respondents agreement with the Medicare understandability question did not appear to be related to any of the variables of interest.

Summary of Validity Analyses. Generally, the results of the validity analyses for sample members provide evidence for the construct validity of the scale. One unexpected result is that older beneficiaries had more knowledge than younger beneficiaries rather than the reverse. Also, there was not a clear monotonic relationship between knowledge and covered institutional charges. The results for proxy respondents differed from those for sample members and do not appear to support the validity of the scale for proxies. However, these results may not be significant because of the much smaller sample size for proxies than for sample members.

3.2.2 Global Know-All-Need-to-Know Question

3.2.2.1 Descriptive Statistics. Another possible indicator of beneficiary knowledge of the Medicare system is the global question of whether beneficiaries feel that they know everything they need to know about the Medicare program. The frequency of responses to this question is presented in Table 2. The majority of respondents reported that they knew most of what they needed to know, while a smaller percentage of beneficiaries responded that they knew just about everything they needed to know about the Medicare program. There were very few "not ascertained" responses, suggesting that missing data were not a threat to the validity of this measure.

Table 2. Frequency (and Percentage) of Responses to the Global Know-All-Need-to-Know Question

Response Categories	Sample Member Interviews	Proxy Interviews
Almost none of what I need to know	2,059 (15.8%)	247 (16.8%)
A little of what I need to know	2,804 (21.5%)	326 (22.1%)
Some of what I need to know	3,667 (28.1%)	465 (31.6%)
Most of what I need to know	3,205 (24.5%)	307 (20.9%)
Just about everything I need to know	1,243 (9.5%)	115 (7.8%)
Don't know or refused [1]	87 (0.7%)	11 (0.8%)
Not ascertained [1]	3 (0.0%)	1 (0.1%)

[1]For the analyses, these responses were recoded as missing.

3.2.2.2 Reliability. Coefficient alpha for this question was not computed because this is a one-item scale. Therefore, internal consistency is not relevant.

3.2.2.3 Validity. To evaluate the validity of this question for measuring knowledge, chi-square tests were performed to assess whether question value responses were related to group membership. The results of these analyses are presented in Table A-5 of Appendix A. Proxy and sample member respondents were analyzed separately. Sample member respondents had higher scores on this question than proxy respondents ($\chi^2(4) = 18.45$, p = .001).

Sample Member Interviews. Sample member respondents were compared on various demographic and experience variables. The chi-square tests were significant for almost all of the variables. Examining the frequencies indicates that the following groups were more likely to report that they knew most or all of what they needed to know about the Medicare program:

- male respondents,
- white respondents,
- respondents with higher incomes,
- respondents with higher levels of education,

- respondents who were aged 65 to 75,
- respondents with Medicare and private insurance,
- respondents with better self-reported health status,
- respondents who had been enrolled in managed care during the past year,
- respondents who were eligible for Medicare because of their age,
- respondents with any institutional utilization,
- respondents with any Part B claims,
- respondents with total covered charges of $500 to $4,999,
- respondents with total reimbursed dollars of $500 to $4,999, and
- respondents with allowed Part B charges of $500 to $4,999.

Proxy Interviews. Proxy respondents were also compared on several background variables. Reviewing the frequency distributions indicates that the following groups were more likely to report that they knew most or all of what they needed to know about the Medicare program:

- respondents with more education,
- respondents with higher incomes,
- white respondents,
- respondents with Medicare and private insurance,
- respondents with some Part B claims, and
- respondents with allowed Part B charges of $500 to $4,999.

Summary of Validity Analyses. Overall, the results for sample members demonstrated evidence for the construct validity of the scale. The analyses indicated significant differences between all groups who were hypothesized to vary in their levels of knowledge. Among proxy respondents, there were fewer significant results, however, the results that were significant indicate the expected patterns and therefore support the construct validity of the scale.

3.2.3 Know-All-Need-to-Know Index

3.2.3.1 Descriptive Statistics. The descriptive statistics for the know-all-need-to-know index are presented in Table 3. Overall, the distribution of scores for sample member respondents appears to be slightly skewed with the mode being a higher value than the mean and median. The distribution of scores for proxy respondents appears to have a normal distribution with the mean, median, and mode having similar values. Table 4 contains the item-total score correlations for the Know-All-Need-to-Know items. All of the items were highly correlated with the total score, suggesting that these items were highly related and appear to be measuring the same construct.

Table 3. Descriptive Statistics of the Know-All-Need-to-Know Index

Interview Type/Survey Year	N	Mean	S.D.	Median	Mode
Sample Member Interviews					
1996 (Round 17)	11,194	15.26	5.48	15	17
1998 (Round 24)	12,524	15.21	5.00	15	15
Proxy Interviews					
1996 (Round 17)	1,330	14.86	5.59	15	17
1998 (Round 24)	1,361	14.79	5.08	15	15

Table 4. Item-Total Score Correlations for the Know-All-Need-to-Know Items

Question	Sample Member Respondents		Proxy Respondents	
	1996	**1998**	**1996**	**1998**
Medicare program	0.73	0.71	0.72	0.72
Paying for medical services	0.74	0.69	0.74	0.73
Supplemental insurance	0.67	0.62	0.70	0.65
Medicare HMOs	0.52	0.50	0.54	0.55
Choosing a doctor	0.57	0.56	0.61	0.57

3.2.3.2 Reliability. Cronbach's alpha had a value of 0.84 for sample members in 1996 and 0.82 for sample members in 1998. Similar values for alpha were obtained for proxies in 1996 ($\alpha = 0.85$) and 1998 ($\alpha = 0.84$). These values demonstrate that this scale has strong internal consistency. Coefficient alphas of the know-all-need-to-know index were also calculated separately for various subgroups classified according to: experience with Medicare, enrollment in managed care, institutional and Part B utilization, and amounts of allowable and reimbursed charges. For details of these results, please refer to Tables A-6 through A-13 of Appendix A. The coefficient alphas for the different groups were very similar. Among sample member respondents, values ranged from 0.81 to 0.88. Proxy respondents had similar values with alphas also ranging from 0.82 to 0.88.

3.2.3.3 Validity. Construct validity was assessed by determining if particular groups differed by index scores. Similar to the Medicare understandability question, all index value validity measures were computed separately for sample member and proxy interviews. As hypothesized, sample member respondents had higher scores on the know-all-need-to-know index than proxy respondents both during 1996 ($t(12522) = 2.53$, $p = .011$) and during 1998 ($t(13883) = 2.97$, $p = .003$).

Sample Member Interviews. Analyses using t-tests or analysis of variance (ANOVAs) revealed that know-all-need-to-know index scores were significantly different on nearly all variables. (Refer to Tables A-14 and A-15 in Appendix A for details from the statistical tests.) Overall, mean index scores were higher among the following:

- male respondents,
- white respondents,
- individuals with higher incomes,
- individuals between 65 and 75 years old,
- individuals with more education,
- individuals who aged in to Medicare,
- individuals who had been enrolled in managed care during the past year,
- individuals with better self-reported general health, and
- individuals receiving a private supplemental insurance policy in addition to Medicare.

Sample members' know-all-need-to-know scores also differed significantly based on service utilization. The results indicate that these respondents received higher know-all-need-to-know scores:

- respondents with any institutional utilization,
- respondents with any Part B utilization,
- respondents with some total covered charges,
- respondents with some total reimbursed dollars, and
- respondents with higher Part B charges.

Proxy Interviews. Know-all-need-to-know index scores were significantly different on some of the demographic variables. Specifically, mean index scores were significantly higher among the following groups:

- individuals with higher incomes,
- individuals with more than an 8th grade education,
- individuals who were 65 years old and older,
- individuals who had aged in to the Medicare program,
- individuals with better self-reported health status,
- white respondents, and
- individuals receiving a private supplemental insurance policy in addition to Medicare.

In addition, during 1996, individuals with enrollment in managed care during the past year had higher scores than those with no enrollment.

Mean know-all-need-to-know scores for proxy respondents also differed significantly by service utilization. These groups reported higher scores for the know-all-need-to-know index:

- individuals with any institutional utilization,
- individuals with any Part B utilization,
- individuals with some Part B charges, and
- individuals with higher total covered charges.

Summary of Validity Analyses. During both 1996 and 1998, the data for sample members and proxy respondents provides evidence for the construct validity of the scale. Although there were no significant differences for covered institutional charges, all other analyses indicated that respondents who were expected to have higher levels of knowledge received higher know-all-need-to-know scores.

3.2.4 Four-Item Quiz

3.2.4.1 Descriptive Statistics. Table 5 contains the distribution of the four-item quiz scores. As shown in the table, there was variability in the quiz scores. The majority of respondents obtained a score of 3 on this quiz while the smallest number of respondents received a score of 0.

The item-total score correlations for these quiz questions are displayed in Table 6. These correlations were expected to reach values greater than 0.30. Only two of the questions (doctor's charges and disagreement with claim decision) met this criterion, and a third item (flu shots) was close to 0.30. The question on annual physical exams had a somewhat lower correlation ($r = 0.17$) than the other items. This item was not removed from the scale, however, because removing the item would produce only a very small increase in Cronbach's alpha. Also, this quiz contains a very small number of items and removing this question would substantially decrease the possible range of scores and therefore the ability of the quiz to discriminate among various groups.

Table 5. Frequency (and Percentage) of Scores on the Four-Item Quiz

Interview Type	Scores				
	0	**1**	**2**	**3**	**4**
Sample Member	895 (7.9%)	1,414 (12.5%)	2,624 (23.2%)	4,369 (38.7%)	1,998 (17.7%)
Proxy	140 (10.4%)	172 (12.8%)	321 (23.9%)	497 (37.0%)	213 (15.9%)

Table 6. Item-Total Score Correlations for the Four-Item Quiz Questions

Question	Sample Member Interviews	Proxy Interviews
Flu shots	0.29	0.32
Annual physical exam	0.17	0.21
Doctors' charges	0.38	0.47
Disagreement with claim decision	0.41	0.45

3.2.4.2 *Reliability*. As a measure of internal consistency, Cronbach's alpha was computed for the four quiz items. The coefficient alpha for sample member respondents was 0.52 and among proxy respondents had a value of 0.58. Although these values for alpha were somewhat low, alphas greater than 0.50 are sometimes considered acceptable for scales under development. The low values for coefficient alpha may be a reflection of the small number of items used to calculate the score.

To determine whether the internal consistency of the four-item quiz varies across different groups, the coefficient alphas for the quiz were calculated separately for various groups. These results are presented in Tables A-16 through A-19 of Appendix A. Overall, the alphas were similar across most groups. One notable difference was that the alpha for sample members new to the Medicare system (0.69) was higher than the alpha for those experienced with the system (0.51), suggesting that the internal consistency of the scale was higher among this group.

3.2.3.3 *Validity*. Construct validity was assessed by determining whether particular groups who should differ in knowledge actually differed in their quiz scores. All validity measures were computed separately for sample member and proxy interviews. As hypothesized, sample member respondents scored higher on the four-item quiz than proxy respondents ($\chi^2(4) = 12.65$, $p = .013$).

Sample Member Interviews. Analyses using chi-square tests revealed that, among sample members, individuals differed significantly on nearly all proposed variables (see Table A-20 in Appendix A for details of results). Higher quiz scores were associated with

- individuals with higher education,
- individuals with higher incomes,
- white respondents,
- male respondents,
- individuals aged 65 to74,
- individuals who had first become eligible for Medicare due to their age,
- individuals who were not enrolled in managed care during the past year,
- individuals in better general health, and
- individuals with Medicare and private supplemental health insurance.

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The only variable that was not significantly different among sample members was experience with the Medicare system.

Health care utilization was variously defined as ever/never use (or ever/never use of specific services), and the charges incurred from using Medicare. With ever/never health care use, quiz scores were significantly different and tended to be higher among individuals who had used health care (e.g., any institutional utilization, having at least one Medicare Part B claim within the past calendar year). Among the variables that measured incurred charges (e.g., total covered charges, total reimbursed dollars, covered institutional charges, and allowed Part B charges), all reported significant differences in quiz scores by the groups. Upon examining the frequencies, the scores of individuals with any charges were higher than the scores of individuals with no charges. The charge category having the highest quiz scores varied widely.

Proxy Interviews. Proxy respondents were assessed separately from sample members. Overall, the following proxy groups tended to have higher quiz scores:

- individuals with higher education,
- individuals with higher incomes,
- older individuals (over age 75),
- individuals who had aged into Medicare,
- individuals who were not enrolled in managed care during the past year,
- white individuals,
- individuals tending to be in better health, and
- individuals receiving a private supplemental insurance policy in addition to Medicare.

Quiz scores were not significantly different according to gender. Due to the small number of proxy respondents exactly 65 years old, a comparison of experienced Medicare beneficiaries against new beneficiaries could not be made.

Quiz scores of proxy respondents were significantly different on health care utilization. Proxy respondents whose sample members had any institutional utilization in the past year or who had one or more Medicare Part B claims tended to have significantly higher quiz scores than their counterparts. Similar to sample member interviews, proxy respondent quiz scores were higher if the sample member had incurred any charges for health care; the highest quiz score categories varied by charges incurred.

Summary of Validity Analyses. For both sample members and proxy respondents, those who were expected to have higher levels of knowledge had significantly higher quiz scores. These results provide evidence for the construct validity of the four-item quiz.

3.2.5 Three-Item Quiz

3.2.5.1 Descriptive Statistics. Table 7 contains the descriptive statistics of the three-item quiz scores. The distribution suggests that there is variability in the scores. The most common score for sample member respondents was 2, while among proxy respondents 1 and 2 were the most frequent scores.

Table 8 displays the item-total score correlations for the three quiz items. The correlations exceeded or were close to 0.30, suggesting that the items were related to the overall quiz score. The question on colorectal cancer screening had the highest correlation, indicating that this item was the most highly related to the total quiz score.

Table 7. Frequency (and Percentage) of Scores on the Three-Item Quiz

Interview Type	Scores			
	0	1	2	3
Sample Member	1340 (10.6%)	3642 (28.9%)	4387 (34.8%)	3225 (25.6%)
Proxy	174 (12.7%)	435 (31.8%)	430 (31.4%)	331 (24.2%)

Table 8. Item-Total Score Correlations for the Three-Item Quiz Questions

Question	Sample Member Interviews	Proxy Interviews
Colorectal cancer screening	0.33	0.37
Supplemental insurance	0.27	0.31
Flu shots	0.28	0.28

3.2.5.2 Reliability. As a measure of internal consistency, Cronbach's alpha was calculated for sample member respondents ($\alpha = 0.46$) and proxy respondents ($\alpha = 0.50$). The coefficient alpha for sample member respondents had a low value, which was probably due to the small number of items comprising the scale.

Next, the coefficient alphas for the three-item quiz were calculated separately for various groups to determine whether the internal consistency of the quiz varied across different groups. The coefficient alphas for these groups are displayed in Tables A-21 through A-24 of Appendix A. Among sample members, the alphas ranged from 0.41 to 0.53, and among proxy respondents the values for alpha ranged from 0.43 to 0.56. Generally, higher internal consistency occurred among respondents with no service utilization.

3.2.5.3 Validity. In an effort to establish the construct validity of the scale, quiz scores of several groups known to differ in knowledge levels were compared using chi-square tests. The results of those analyses are presented in Table A-25 in Appendix A with values displayed separately for sample members and proxy respondents. As hypothesized, sample member respondents had higher quiz scores than proxy respondents ($\chi^2(3) = 13.51$, p = .004).

Sample Member Interviews. Comparisons among sample members indicated that individuals differed significantly on nearly all proposed variables. Higher quiz scores were associated with
- respondents with more education,
- respondents aged 65 to 75,
- respondents eligible for Medicare because of their age,
- respondents with higher incomes,
- white respondents,
- respondents with better self-reported health status,
- respondents with Medicare and private insurance, and
- respondents who had been enrolled in managed care during the past year.

There were also significant differences between groups based on service utilization. Respondents with any institutional utilization or some Part B claims had higher quiz scores than those who had not used these services. Generally, those with higher total covered charges, higher total reimbursed dollars, or higher Part B charges had higher quiz scores than those with lower charges. Also, respondents with some institutional charges had higher quiz scores than those with no institutional charges.

Proxy Interviews. Interviews from proxy respondents were assessed separately from sample members' interviews. Analyses of the proxy respondents suggest that the following groups generally had higher quiz scores:

- respondents with more education,
- respondents aged 65 to 75,
- respondents who were eligible for Medicare because of their age,
- respondents with higher incomes,
- white respondents, and
- respondents with Medicare and private insurance.

As with the sample member respondents, proxy respondents with any institutional utilization and those with some Part B claims had higher quiz scores than those with no utilization. Also, respondents with some total covered charges, total reimbursed dollars,

institutional charges, or allowed Part B charges scored higher on the quiz than respondents without any charges.

Summary of Validity Analyses. Overall, among sample members, groups who were expected to differ in knowledge received significantly higher quiz scores than their counterparts. One exception is that although the literature suggests that male respondents have more knowledge than female respondents, there were no significant gender differences. Similar results were found for proxy respondents, however, in contrast to sample members, there were no significant differences in quiz scores based on health status or enrollment in managed care. Overall, these results provide support for the construct validity of the three-item quiz.

3.2.6 Eight-Item Quiz

3.2.6.1 Descriptive Statistics. Another possible measure of beneficiary knowledge is the eight-item quiz administered during 1998. Table 9 contains the descriptive statistics for the eight-item quiz scores displayed separately for sample member and proxy respondents. The distribution of scores was slightly negatively skewed with the mode having a higher value than the mean and median. Table 10 contains the item-total score correlations for the items on the eight-item quiz. All of the items had item-total correlations exceeding 0.30, suggesting that all of the items appeared to be measuring the same construct.

Table 9. Descriptive Statistics of the Eight-Item Quiz

Interview Type	N	Mean	S.D.	Median	Mode
Sample Member	13,062	4.48	2.36	5	6
Proxy	1,470	4.23	2.48	5	6

Table 10. Item-Total Score Correlations for the Eight-Item Quiz Questions

Question	Sample Member Interviews	Proxy Interviews
Can select different health plan options	0.45	0.46
Medicare only pays for all health care expenses	0.38	0.41
Do not have to change way get Medicare services	0.45	0.49
Medicare offers more information	0.38	0.39
Can report complaints to Medicare about HMOs and supplemental insurance	0.47	0.54
Limited choices about doctors if on HMOs	0.53	0.58
Can drop HMO and still be covered by Medicare	0.54	0.59
HMOs cover more health services	0.49	0.51

3.2.6.2 Reliability. Reliability was measured using internal consistency. The Cronbach's alpha for the eight-item quiz was 0.76 for sample members and 0.79 for proxy respondents, indicating that this quiz reached an acceptable level of reliability.

To determine whether the internal consistency of the eight-item quiz varied across different groups, the coefficient alphas for the quiz were calculated separately for various groups. These results are presented in Tables A-26 through A-29 of Appendix A. Generally, the values were similar across all of the groups, with alphas ranging from 0.72 to 0.80 for sample members and from 0.75 to 0.81 for proxies.

3.2.6.3 *Validity*. To assess construct validity, particular groups who should differ in knowledge were compared to determine if they did in fact differ in their quiz scores. (See Table A-30 in Appendix A for details of the statistical results.) All validity measures were conducted separately for sample member and proxy interviews. As hypothesized, sample member respondents had higher quiz scores than proxy respondents $(t(14530) = 3.75, p < .001)$.

Sample Member Interviews. Analyses using t-tests and ANOVAs revealed that, among sample members, the following groups had higher eight-item quiz scores:

- male respondents,
- white respondents,
- respondents with higher incomes,
- respondents with more education,
- respondents aged 65 to 75,
- respondents with better self-reported health status,
- respondents eligible for Medicare due to their age,
- respondents who had been enrolled in managed care during the past year, and
- respondents with Medicare only or Medicare and private insurance.

Additionally, the comparisons on the service utilization variables indicated that respondents with some Part B claims had higher quiz scores. Respondents with total covered charges of $500 to $4,999 had higher quiz scores as did respondents with total reimbursed dollars of $1 to $499. Respondents who generally had higher Part B charges also had higher quiz scores. In contrast, respondents with no institutional charges received higher scores on the eight-item quiz.

Proxy Interviews. Similar analyses were conducted for proxy respondents. The results indicated that the following respondents generally had higher eight-item quiz scores:

- respondents who were eligible for Medicare because of their age,
- respondents with higher incomes,
- white respondents,
- respondents with some enrollment in managed care during the past year,
- respondents with more education,

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- respondents over 65 years of age,
- respondents with better self-reported health status, and
- respondents with Medicare only or Medicare and private insurance.

The results of the analyses of the service utilization suggest that respondent with higher levels of utilization had higher quiz scores. Specifically, examining the means for each group indicates that individuals with total covered charges, total reimbursed dollars, or covered institutional charges of $500 to $4,999 had higher mean quiz scores. Respondents with Part B charges of $500 to $1,499 also had higher quiz scores. In addition, respondents with some Part B claims during the past year received higher scores than those with no claims.

Summary of Validity Analyses. Among sample member respondents, most results are in the expected direction and therefore provide evidence for the construct validity of the scale. However, there was not a clear relationship between incurred charges and quiz scores. Similar results were found for proxy respondents although the comparison between genders was not significant.

3.2.7 Relationships Among Knowledge Scales

In order to gather further evidence for the construct validity of the knowledge scales, correlations between each of the knowledge scales were computed. The following three knowledge scales were all administered during 1996: the Medicare understandability question, the four-item quiz and the know-all-need-to-know index. The correlations between these scales are presented in Table 11.

The know-all-need-to-know index was also administered during 1998, along with the global know-all-need-to-know question, the three-item quiz, and the eight-item quiz. The eight-item quiz and the global know-all-need-to-know question were administered in Round 23 while the know-all-need-to-know index and the three-item quiz were both administered approximately 4 months later during Round 24. We point this out because it is possible that during the interval between Round 23 and Round 24 a respondent's level of knowledge may have changed. Therefore, the correlations between scales administered during different rounds may underestimate the relationship between these scales. The correlations between the scales administered during 1998 are presented in Table 12.

Table 11. Correlations Between Knowledge Scales During 1996

Scale Type	Medicare Understandability	Four-Item Quiz	Know-All- Need-to- Know Index
Medicare Understandability Question	1.00	0.14	0.24
Four-Item Quiz	0.14	1.00	**0.32**
Know-All-Need-to-Know Index	0.24	**0.32**	1.00

Table 12. Correlations between Knowledge Scales during 1998.

Scale Type	Three-Item Quiz	Eight-Item Quiz	Know-All- Need-to- Know Index	Global KANTK Question
Three-Item Quiz	1.00	**0.37**	**0.38**	0.26
Eight-Item Quiz	**0.37**	1.00	**0.36**	**0.31**
Know-All-Need-to-Know Index	**0.38**	**0.36**	1.00	**0.44**
Global KANTK Question	0.26	**0.31**	**0.44**	1.00

Note: The abbreviation KANTK refers to Know-All-Need-to-Know.

Evidence for construct validity is present when scales measuring the same construct are highly related. Correlations with magnitudes greater than 0.30 are generally considered substantial (Cohen, 1988). The results from the 1996 data indicate that the four-item quiz and the know-all-need-to-know index are related. In contrast, the Medicare understandability question does not appear to be related to either of the other two scales. The correlations for the 1998 data indicate that the three-item quiz, eight-item quiz, and know-all-need-to-know index are substantially correlated. In addition, the global know-all-need-to-know question is correlated with the eight-item quiz and the know-all-need-to-know index. Overall, these results suggest that the quizzes and the know-all-need-to-know index appear to be measuring the same construct which is presumably knowledge; however, the Medicare understandability question appears to be measuring a somewhat different construct.

4.0   Conclusions and Recommendations

The knowledge scales were evaluated on several different criteria, including internal consistency reliability and construct validity. The results of the comparisons among known groups indicate that the Medicare understandability question demonstrates evidence of construct validity. Respondents who were expected to have higher knowledge of Medicare were more likely to respond that the Medicare program is understandable. There are, however, various limitations in using this global question to measure beneficiary knowledge. First of all, this question was not correlated with the other knowledge scales, suggesting that it may be measuring a different construct. Next, the question provides only two response alternatives (yes or no), limiting the precision with which differences among groups or change within groups can be described. Also, because this is only a single item, it can provide only a limited amount of information. For example, in 1995, approximately 30% of beneficiaries indicated that they felt that the Medicare program was not understandable. However, this does not provide information on what specific areas of Medicare the respondents did not understand.

The global know-all-need-to-know question also performed well on the known-groups validity analyses. Those who were expected to have more knowledge received higher scores on this question than those who were expected to have lower knowledge levels. In contrast to the Medicare understandability question, this question was correlated with the know-all-need-to-know scale and the eight-item quiz, suggesting that it is measuring the same underlying construct. However, this question has the same limitations as the Medicare understandability question in that it is only one item and therefore can provide only very limited information about knowledge of the Medicare program.

The know-all-need-to-know scale performed very well on all of the psychometric analyses, demonstrating high levels of internal consistency reliability and acceptable validity. However, one concern with using the know-all-need-to-know scale to measure knowledge is that this scale relies on individual self-report of knowledge rather than actually requiring beneficiaries to demonstrate that they do in fact have knowledge of the Medicare program. Therefore, the know-all-need-to-know scale may be measuring some other construct (e.g., perception of knowledge) rather than the actual level of knowledge. For example, individuals who are overly confident or less likely to admit that they do not understand a topic may report knowing everything they need to know regardless of their actual knowledge levels.

The three true/false quizzes (three-item quiz, four-item quiz, and eight-item quiz) avoid this limitation. These quizzes are closer approximations of beneficiary knowledge than either the Medicare understandability question, the global know-all-need-to-know question, or the know-all-need-to-know index because they require respondents to demonstrate knowledge by selecting the correct response to a question.

Both the three-item quiz and four-item quiz performed well on the validity analyses. The four-item quiz demonstrated acceptable reliability for a scale under development; however, the three-item quiz did not reach the acceptable level for reliability. A major limitation of these quizzes as measures of knowledge is the small number of items included on the quizzes. Because of the small number of items, these quizzes cannot cover all of the information that Medicare beneficiaries need to know in order to successfully negotiate the Medicare program. Also, there are only a small number of possible quiz scores, which does not give the quizzes much power to detect differences in knowledge. Furthermore, the internal consistency results suggested that increasing the number of items on the quizzes would increase the reliability of the scales. Therefore, it is recommended that additional items be added to these scales.

Of the six potential knowledge measures, the eight-item quiz provides the most precise indicator of beneficiary knowledge. The eight-item quiz performed well on all of the psychometric properties assessed here and is a direct measure of knowledge because it requires respondents to demonstrate their knowledge rather than simply reporting that they believe they have enough knowledge. In addition, the eight-item quiz has a larger number of items than the other quizzes, thereby increasing the range of possible scores and providing more power to discriminate among and within beneficiaries.

However, it should be noted that the item content of the quiz is somewhat limited and does not contain questions that address knowledge of the entire Medicare program. Rather, it appears to represent a sound measure of beneficiary knowledge of the Medicare managed care options. Increasing the number of items on the eight-item quiz would enhance the ability of the quiz to evaluate the entire domain of information that impacts beneficiaries' ability to make informed health care decisions. For example, items could be added that address knowledge of Medicare benefits as well as items on knowledge of the Medicare program structure and processes. A potential source for additional items is the knowledge index included in the *Medicare and You* evaluation.

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Appendix A

Tables of Results from Psychometric Analyses

List of Tables in Appendix A

List of Tables in Appendix A (continued)

Table A-1. MCBS Knowledge Questions

Question Wording	Round	Year
Medicare Understandability Question	**14, 17, 20**	**1995, 1996, 1997**
In general, do you think the Medicare program is understandable?		
Global Know-All-Need-to-Know Question	**23**	**1998**
How much do you think you know about the Medicare program? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about the Medicare program?		
Know-All-Need-to-Know Index (1996)	**18**	**1996**
How much do you feel you know about the Medicare program, such as what medical services Medicare covers or does not cover? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about the Medicare program?		
How much do you feel you know about how much you have to pay for medical services covered by Medicare? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about how much you have to pay for medical services covered by Medicare?		
How much do you feel you know about supplemental or Medigap insurance, such as what it covers or how it works with Medicare to pay medical claims? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about supplemental insurance?		
How much do you feel you know about the availability and benefits of Medicare Health Maintenance Organizations? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about the availability and benefits of Medicare HMOs?		
How much do you feel you know about choosing or finding a doctor or other health care provider? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about finding a doctor or other health care provider?		

Question Wording	Round	Year
Know-All-Need-to-Know Index (1998)	**24**	**1998**
How much do you feel you know about what medical services Medicare covers or does not cover? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about what Medicare covers or doesn't cover?		
How much do you feel you know about how much you have to pay for medical services? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about how much you have to pay for medical services?		
How much do you feel you know about supplemental or Medigap insurance, such as what it covers or how it works with Medicare to pay medical claims? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about supplemental insurance?		
How much do you feel you know about the availability and benefits of Medicare managed care plans? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about the availability and benefits of managed care plans?		
How much do you feel you know about choosing or finding a doctor or other health care provider? Do you know just about everything you need to know, most of what you need to know, some of what you need to know, a little of what you need to know, or almost none of what you need to know about finding a doctor or other health care provider?		
4-Item Quiz[1, 2]	**18**	**1996**
Medicare pays for flu shots. *(True)*		
Medicare pays for an annual physical examination. *(False)*		
A doctor who accepts assignment can't charge more than Medicare allows for covered services. *(True)*		
If you don't agree with a decision Medicare makes on a claim from a doctor or hospital, such as whether it will cover the service or how much it will pay, you can appeal the decision. *(True)*		

See notes at end of the table.

Table A-1 (continued)

Question Wording	Round	Year
3-Item Quiz[1,2]	**24**	**1998**
Medicare covers colorectal cancer screening. *(True)*		
Medigap or supplemental insurance is the same as a Medicare managed care plan. *(False)*		
Medicare covers an annual flu shot. *(True)*		
8-Item Quiz[1,2]	**23**	**1998**
Most people covered by Medicare can select among different kinds of health plan options within Medicare. *(True)*		
Medicare without a supplemental insurance policy pays for all of your health care expenses. *(False)*		
If you are happy with the way you currently receive health care, you do not have to make any changes in the way you get your Medicare services. *(True)*[3]		
The Medicare program has recently begun to offer more information and help in order to answer your Medicare questions. *(True)*		
People can report complaints to Medicare about their Medicare managed care plans (HMOs) or supplemental plans if they are not satisfied with them. *(True)*		
If someone joins a Medicare managed care plan (HMO) that covers people on Medicare, they have limited choices about which doctors they can see. *(True)*		
If someone joins a Medicare managed care plan (HMO) that covers people on Medicare, they can change or drop the plan and still be covered by Medicare. *(True)*		
Medicare managed care plans (HMOs) that cover people on Medicare often cover more health services, like prescribed medicine, than Medicare without a supplemental policy. *(True)*		

[1] The correct answers to the quiz questions are presented in italics following each question.

[2] For each of the quizzes, only one of the questions has a correct answer of false. Because there is a possibility of a response set bias, it is often preferable to vary the correct responses to the questions on a quiz rather than having the same correct response for almost all of the questions.

[3] Occasionally there are circumstances where a beneficiary may have to change health plans even if he/she is happy with the plan, such as when an HMO drops out of the market. However, because in most circumstances this statement is true, the correct answer to this quiz question was assumed to be true.

A-3

Table A-2. Chi-Square Tests of Associations Between Medicare Understandability Question and Background Variables

Interview Type/Survey Year	Chi-Square Tests			
	Gender	Race	Age	Income
Sample Member Interviews				
1995 (Round 14)	$\chi^2 (1) = 5.63, p = .018$	$\chi^2 (1) = 35.59, p = .001$	$\chi^2 (2) = 20.76, p = .001$	$\chi^2 (1) = 49.05, p = .001$
1996 (Round 17)	$\chi^2 (1) = 7.07, p = .008$	$\chi^2 (1) = 30.10, p = .001$	$\chi^2 (2) = 41.42, p = .001$	$\chi^2 (1) = 43.00, p = .001$
1997 (Round 20)	$\chi^2 (1) = 5.17, p = .023$	$\chi^2 (1) = 9.94, p = .002$	$\chi^2 (2) = 36.54, p = .001$	$\chi^2 (1) = 35.49, p = .001$
Proxy Interviews				
1995 (Round 14)	$\chi^2 (1) = 0.15$, n.s.	$\chi^2 (1) = 2.50$, n.s.	$\chi^2 (2) = 0.56$, n.s.	$\chi^2 (1) = 0.53$, n.s.
1996 (Round 17)	$\chi^2 (1) = 0.34$, n.s.	$\chi^2 (1) = 0.41$, n.s.	$\chi^2 (2) = 2.64$, n.s.	$\chi^2 (1) = 0.39$, n.s.
1997 (Round 20)	$\chi^2 (1) = 0.00$, n.s.	$\chi^2 (1) = 9.84, p = .002$	$\chi^2 (2) = 6.55, p = .038$	$\chi^2 (1) = 2.98$, n.s.

Table A-3. Chi-Square Tests of Associations Between Medicare Understandability Question and Background Variables

Interview Type/Survey Year	Chi-Square Tests			
	Education	Health Status	Medicare Enrollment Status	Type of Insurance
Sample Member Interviews				
1995 (Round 14)	$\chi^2 (2) = 131.61, p = .001$	$\chi^2 (4) = 104.35, p = .001$	$\chi^2 (1) = 19.13, p = .001$	$\chi^2 (2) = 81.46, p = .001$
1996 (Round 17)	$\chi^2 (2) = 82.39, p = .001$	$\chi^2 (4) = 81.11, p = .001$	$\chi^2 (1) = 22.89, p = .001$	$\chi^2 (2) = 50.35, p = .001$
1997 (Round 20)	$\chi^2 (2) = 93.51, p = .001$	$\chi^2 (4) = 81.91, p = .001$	$\chi^2 (1) = 25.03, p = .001$	$\chi^2 (2) = 60.73, p = .001$
Proxy Interviews				
1995 (Round 14)	$\chi^2 (2) = 7.29, p = .026$	$\chi^2 (4) = 0.99$, n.s.	$\chi^2 (1) = 0.26$, n.s.	$\chi^2 (2) = 2.80$, n.s.
1996 (Round 17)	$\chi^2 (2) = 1.45$, n.s.	$\chi^2 (4) = 4.64$, n.s.	$\chi^2 (1) = 0.45$, n.s.	$\chi^2 (2) = 5.40$, n.s.
1997 (Round 20)	$\chi^2 (2) = 2.50$, n.s.	$\chi^2 (4) = 3.09$, n.s.	$\chi^2 (1) = 4.17, p = .041$	$\chi^2 (2) = 6.99, p = .030$

Table A-4. Chi-Square Tests of Associations Between Medicare Understandability Question and Service Utilization Variables

Interview Type/Survey Year	Chi-Square Tests			
	Managed Care	**Institutional Utilization[1]**	**Part B Utilization[1]**	**Total Covered Charges[1]**
Sample Member Interviews				
1995 (Round 14)	$\chi^2 (1) = 8.63$, p = .003	$\chi^2 (1) = 10.30$, p = .001	$\chi^2 (1) = 33.95$, p = .001	$\chi^2 (3) = 48.93$, p = .001
1996 (Round 17)	$\chi^2 (1) = 8.77$, p = .003	$\chi^2 (1) = 8.40$, p = .004	$\chi^2 (1) = 14.51$, p = .001	$\chi^2 (3) = 29.16$, p = .001
1997 (Round 20)	$\chi^2 (1) = 8.20$, p = .004	$\chi^2 (1) = 3.07$, n.s.	$\chi^2 (1) = 26.41$, p = .001	$\chi^2 (3) = 36.55$, p = .001
Proxy Interviews				
1995 (Round 14)	$\chi^2 (1) = 0.17$, n.s.	$\chi^2 (1) = 3.93$, p = .047	$\chi^2 (1) = 8.67$, p = .003	$\chi^2 (3) = 11.89$, p = .008
1996 (Round 17)	$\chi^2 (1) = 3.37$, n.s.	$\chi^2 (1) = 1.11$, n.s.	$\chi^2 (1) = 0.28$, n.s.	$\chi^2 (3) = 3.67$, n.s.
1997 (Round 20)	$\chi^2 (1) = 1.63$, n.s.	$\chi^2 (1) = 0.41$, n.s.	$\chi^2 (1) = 0.12$, n.s.	$\chi^2 (3) = 2.13$, n.s.

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-4 (continued)

Interview Type/Survey Year	Chi-Square Tests		
	Total Reimbursed Dollars[1]	**Covered Institutional Charges[1]**	**Allowed Part B Charges[1]**
Sample Member Interviews			
1995 (Round 14)	$\chi^2 (3) = 42.52$, p = .001	$\chi^2 (3) = 13.84$, p = .003	$\chi^2 (3) = 49.32$, p = .001
1996 (Round 17)	$\chi^2 (3) = 31.77$, p = .001	$\chi^2 (3) = 11.26$, p = .010	$\chi^2 (3) = 38.56$, p = .001
1997 (Round 20)	$\chi^2 (3) = 45.23$, p = .001	$\chi^2 (3) = 12.67$, p = .005	$\chi^2 (3) = 45.13$, p = .001
Proxy Interviews			
1995 (Round 14)	$\chi^2 (3) = 6.56$, n.s.	$\chi^2 (3) = 4.91$, n.s.	$\chi^2 (3) = 13.80$, p = .003
1996 (Round 17)	$\chi^2 (3) = 5.36$, n.s.	$\chi^2 (3) = 11.10$, p = .011	$\chi^2 (3) = 3.96$, n.s.
1997 (Round 20)	$\chi^2 (3) = 4.22$, n.s.	$\chi^2 (3) = 3.05$, n.s.	$\chi^2 (3) = 1.43$, n.s.

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-5. Results from Statistical Analysis of Global Know-All-Need-to-Know Question

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	25.06	4	0.001
Education	720.13	8	0.001
Age category	107.75	8	0.001
Aged/disabled status	86.25	4	0.001
Income category	313.82	4	0.001
Race (white/nonwhite)	246.26	4	0.001
General health	258.79	16	0.001
Type of insurance	245.73	8	0.001
Managed care	12.49	4	0.014
New/experienced beneficiary	2.88	4	n.s.
Any institutional utilization[1]	15.19	4	0.004
Any Part B claim[1]	128.99	4	0.001
Total covered charges[1]	148.58	12	0.001
Total reimbursed dollars[1]	133.81	12	0.001
Covered institutional charges[1]	21.83	12	0.040
Allowed Part B charges[1]	160.60	12	0.001

See notes at end of table.   (continued)

Table A-5 (continued)

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Proxy Interviews			
Gender	3.77	4	n.s.
Education	26.73	8	0.001
Age category	6.62	8	n.s.
Aged/disabled status	2.09	4	n.s.
Income category	18.78	4	0.001
Race (white/nonwhite)	38.48	4	0.001
General health	22.23	16	n.s.
Type of insurance	38.81	8	0.001
Managed care	7.85	4	n.s.
New/experienced beneficiary[2]	--	--	--
Any institutional utilization[1]	8.56	4	n.s.
Any Part B claim[1]	18.65	4	0.001
Total covered charges[1]	17.70	12	n.s.
Total reimbursed dollars[1]	12.67	12	n.s.
Covered institutional charges[1]	13.30	12	n.s.
Allowed Part B charges[1]	25.33	12	0.013

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.
[2] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

Table A-6. Coefficient Alphas of the Know-All-Need-to-Know Index, by Experience with the Medicare System

Interview Type/Survey Year	New	Experienced
Sample Member Interviews		
1996 (Round 17)	0.88	0.84
1998 (Round 24)	0.83	0.81
Proxy Interviews[1]		
1996 (Round 17)	--	0.85
1998 (Round 24)	--	0.83

[1] Because of the very small sample size of proxy respondents with no experience with the Medicare system, coefficient alphas were not calculated for this group.

Table A-7. Coefficient Alphas of the Know-All-Need-to-Know Index, by Enrollment in Managed Care During the Past Year

Interview Type/Survey Year	No Enrollment	Some Enrollment
Sample Member Interviews		
1996 (Round 17)	0.84	0.85
1998 (Round 24)	0.82	0.83
Proxy Interviews		
1996 (Round 17)	0.85	0.88
1998 (Round 24)	0.84	0.85

Table A-8. Coefficient Alphas of the Know-All-Need-to-Know Index, by Institutional Utilization[1]

Interview Type/Survey Year	No Utilization	Some Utilization
Sample Member Interviews		
1996 (Round 17)	0.84	0.84
1998 (Round 24)	0.83	0.82
Proxy Interviews		
1996 (Round 17)	0.86	0.84
1998 (Round 24)	0.86	0.83

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-9. Coefficient Alphas of the Know-All-Need-to-Know Index, by Part B Utilization[1]

Interview Type/Survey Year	No Utilization	Some Utilization
Sample Member Interviews		
1996 (Round 17)	0.85	0.84
1998 (Round 24)	0.83	0.82
Proxy Interviews		
1996 (Round 17)	0.87	0.84
1998 (Round 24)	0.87	0.84

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-10. Coefficient Alphas of the Know-All-Need-to-Know Index, by Total Covered Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1996 (Round 17)	0.85	0.85	0.83	0.85
1998 (Round 24)	0.83	0.82	0.82	0.83
Proxy Interviews				
1996 (Round 17)	0.87	0.84	0.85	0.84
1998 (Round 24)	0.87	0.84	0.84	0.82

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-11. Coefficient Alphas of the Know-All-Need-to-Know Index, by Total Reimbursed Dollars[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1996 (Round 17)	0.85	0.84	0.84	0.85
1998 (Round 24)	0.83	0.82	0.82	0.83
Proxy Interviews				
1996 (Round 17)	0.87	0.84	0.84	0.85
1998 (Round 24)	0.86	0.85	0.83	0.82

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-12. Coefficient Alphas of the Know-All-Need-to-Know Index, by Total Institutional Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1996 (Round 17)	0.84	0.83	0.84	0.85
1998 (Round 24)	0.83	0.82	0.82	0.83
Proxy Interviews				
1996 (Round 17)	0.86	0.83	0.83	0.85
1998 (Round 24)	0.86	0.83	0.84	0.81

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-13. Coefficient Alphas of the Know-All-Need-to-Know Index, by Allowed Part B Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $1,499	$1,500 or More
Sample Member Interviews				
1996 (Round 17)	0.85	0.85	0.83	0.84
1998 (Round 24)	0.83	0.83	0.82	0.82
Proxy Interviews				
1996 (Round 17)	0.87	0.85	0.85	0.83
1998 (Round 24)	0.87	0.83	0.84	0.83

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-14. Results from Statistical Analysis of Know-All-Need-to-Know Index in 1996

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	-3.35	11192	0.001
Education	328.20	2, 11191	< 0.001
Age category	92.18	2, 11191	< 0.001
Aged/disabled status	12.96	11192	< 0.001
Income category	-20.67	11192	< 0.001
Race (white/nonwhite)	18.53	11192	< 0.001
General health	61.09	4, 11172	< 0.001
Type of insurance	271.66	2, 11191	< 0.001
Managed care	-11.50	2, 11192	< 0.001
New/experienced beneficiary	-1.77	175	n.s.
Any institutional utilization [1]	5.52	9682	< 0.001
Any Part B claim [1]	-11.91	9682	< 0.001
Total covered charges [1]	48.25	3, 9680	< 0.001
Total reimbursed dollars [1]	52.29	3, 9662	< 0.001
Covered institutional charges [1]	12.33	3, 9680	< 0.001
Allowed Part B charges [1]	60.01	3, 9680	< 0.001
Proxy Interviews			
Gender	0.61	1328	n.s.
Education	7.31	2, 1327	0.001
Age category	4.61	2, 1327	0.010
Aged/disabled status	2.92	1328	0.004
Income category	-6.10	1328	< 0.001

See notes at end of table.   (continued)

Table A-14 (continued)

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Proxy Interviews (con.)			
Race (white/nonwhite)	5.11	1328	< 0.001
General health	3.77	4, 1321	0.005
Type of insurance	23.33	2, 1327	< 0.001
Managed care	-3.70	1328	< 0.001
New/experienced beneficiary [2]	--	--	--
Any institutional utilization [1]	2.86	1210	0.004
Any Part B claim [1]	-3.16	1210	0.002
Total covered charges [1]	6.33	3, 1208	< 0.001
Total reimbursed dollars [1]	4.59	3, 1203	0.003
Covered institutional charges [1]	3.95	3, 1208	0.008
Allowed Part B charges [1]	4.43	3, 1208	0.004

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.
[2] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

Table A-15. Results from Statistical Analysis of Know-All-Need-to-Know Index in 1998

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	-3.18	12522	0.002
Education	427.93	2, 12521	< 0.001
Age category	128.83	2, 12521	< 0.001
Aged/disabled status	13.77	12522	< 0.001
Income category	-24.93	12522	< 0.001
Race (white/nonwhite)	24.15	12466	< 0.001
General health	91.98	4, 12497	< 0.001
Type of insurance	323.84	2, 12521	< 0.001
Managed care	-12.38	12522	< 0.001
New/experienced beneficiary	-0.80	178	n.s.
Any institutional utilization [1]	3.39	10195	0.001
Any Part B claim [1]	-12.29	10195	< 0.001
Total covered charges [1]	49.37	3, 10193	< 0.001
Total reimbursed dollars [1]	48.70	3, 10174	< 0.001
Covered institutional charges [1]	3.83	3, 10193	0.009
Allowed Part B charges [1]	61.91	3, 10193	< 0.001
Proxy Interviews			
Gender	0.59	1359	n.s.
Education	18.79	2, 1358	< 0.001
Age category	9.16	2, 1358	< 0.001
Aged/disabled status	4.39	1359	< 0.001
Income category	-7.43	1359	< 0.001

See notes at end of table.   (continued)

Table A-15 (continued)

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Proxy Interviews (con.)			
Race (white/nonwhite)	9.20	1358	< 0.001
General health	2.56	4, 1351	0.037
Type of insurance	41.39	2, 1358	< 0.001
Managed care	-1.71	1359	n.s.
New/experienced beneficiary [2]	--	--	--
Any institutional utilization [1]	2.45	1192	0.014
Any Part B claim [1]	-4.25	1192	< 0.001
Total covered charges [1]	4.48	3, 1190	0.004
Total reimbursed dollars [1]	5.23	3, 1182	0.001
Covered institutional charges [1]	2.95	3, 1190	0.032
Allowed Part B charges [1]	5.26	3, 1190	0.001

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.
[2] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

**Table A-16. Coefficient Alphas of the Four-Item Quiz, by Experience with the
Medicare System**

Interview Type	New	Experienced
Sample Member	0.69	0.51
Proxy[1]	--	0.59

[1] Because of the very small sample size of proxy respondents with no experience with the Medicare system,
coefficient alphas were not calculated for this group.

**Table A-17. Coefficient Alphas of the Four-Item Quiz, by Enrollment in
Managed Care, Institutional Utilization, and Part B Utilization**

	None	Some
Managed Care		
Sample Member Interviews	0.53	0.46
Proxy Interviews	0.59	0.42
Institutional Utilization[1]		
Sample Member Interviews	0.52	0.53
Proxy Interviews	0.62	0.56
Part B Utilization[1]		
Sample Member Interviews	0.53	0.51
Proxy Interviews	0.63	0.56

[1] Only respondents who were not enrolled in managed care during the past year were included
in these analyses.

Table A-18. Coefficient Alphas of the Four-Item Quiz, by Total Covered Charges, Total Reimbursed Dollars, and Total Institutional Charges

	$0	$1 - $499	$500 - $4,999	$5,000 or More
Total Covered Charges[1]				
Sample Member Interviews	0.54	0.48	0.52	0.53
Proxy Interviews	0.66	0.53	0.57	0.57
Total Reimbursed Dollars[1]				
Sample Member Interviews	0.52	0.51	0.51	0.54
Proxy Interviews	0.67	0.49	0.60	0.58
Total Institutional Charges[1]				
Sample Member Interviews	0.52	0.52	0.53	0.54
Proxy Interviews	0.62	0.51	0.58	0.57

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-19. Coefficient Alphas of the Four-Item Quiz, by Allowed Part B Charges[1]

Interview Type	$0	$1 - $499	$500 - $1,499	$1,500 or More
Sample Member	0.53	0.52	0.51	0.51
Proxy	0.65	0.55	0.58	0.55

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-20. Results from Statistical Analysis of Four-Item Quiz

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	13.24	4	0.010
Education	493.33	8	< 0.001
Age category	240.09	8	< 0.001
Aged/disabled status	189.03	4	< 0.001
Income category	317.68	4	< 0.001
Race (white/nonwhite)	559.69	4	< 0.001
General health	127.33	16	< 0.001
Type of insurance	647.55	8	< 0.001
Managed care	63.10	4	< 0.001
New/experienced beneficiary	10.52	4	0.033
Any institutional utilization [1]	101.57	4	< 0.001
Any Part B claim [1]	313.74	4	< 0.001
Total covered charges [1]	332.37	12	< 0.001
Total reimbursed dollars [1]	317.37	12	< 0.001
Covered institutional charges [1]	113.18	12	< 0.001
Allowed Part B charges [1]	337.17	12	< 0.001

See notes at end of table.   (continued)

Table A-20 (continued)

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Proxy Interviews			
Gender	4.09	4	n.s.
Education	41.28	8	< 0.001
Age category	21.00	8	0.007
Aged/disabled status	18.52	4	0.001
Income category	27.71	4	< 0.001
Race (white/nonwhite)	53.75	4	< 0.001
General health	27.97	16	0.032
Type of insurance	86.27	8	< 0.001
Managed care	9.86	4	0.043
New/experienced beneficiary[2]	--	--	--
Any institutional utilization[1]	16.47	4	0.002
Any Part B claim[1]	42.26	4	< 0.001
Total covered charges[1]	50.19	12	< 0.001
Total reimbursed dollars[1]	51.87	12	< 0.001
Covered institutional charges[1]	25.41	12	0.013
Allowed Part B charges[1]	44.66	12	< 0.001

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

[2] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

Table A-21. Coefficient Alphas of the Three-Item Quiz, by Experience with the Medicare System

Interview Type	New	Experienced
Sample Member	0.47	0.45
Proxy[1]	--	0.49

[1] Because of the very small sample size of proxy respondents with no experience with the Medicare system, coefficient alphas were not calculated for this group.

Table A-22. Coefficient Alphas of the Three-Item Quiz, by Enrollment in Managed Care, Institutional Utilization, and Part B Utilization

	None	Some
Managed Care		
Sample Member Interviews	0.47	0.41
Proxy Interviews	0.51	0.43
Institutional Utilization[1]		
Sample Member Interviews	0.50	0.45
Proxy Interviews	0.53	0.48
Part B Utilization[1]		
Sample Member Interviews	0.52	0.45
Proxy Interviews	0.53	0.50

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-23. Coefficient Alphas of the 3-Item Quiz, by Total Covered Charges, Total Reimbursed Dollars, and Total Institutional Charges

	$0	$1 - $499	$500 - $4,999	$5,000 or More
Total Covered Charges[1]				
Sample Member Interviews	0.52	0.47	0.43	0.47
Proxy Interviews	0.54	0.52	0.53	0.43
Total Reimbursed Dollars[1]				
Sample Member Interviews	0.51	0.45	0.44	0.46
Proxy Interviews	0.51	0.56	0.47	0.48
Total Institutional Charges[1]				
Sample Member Interviews	0.50	0.43	0.46	0.47
Proxy Interviews	0.56	0.47	0.48	0.47

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-24. Coefficient Alphas of the Three-Item Quiz, by Allowed Part B Charges[1]

Interview Type	$0	$1 - $499	$500 - $1,499	$1,500 or More
Sample Member	0.53	0.46	0.41	0.46
Proxy	0.51	0.53	0.47	0.48

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-25. Results from Statistical Analysis of Three-Item Quiz

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	45.54	3	0.001
Education	575.82	6	0.001
Age category	329.92	6	0.001
Aged/disabled status	239.79	3	0.001
Income category	418.82	3	0.001
Race (white/nonwhite)	454.77	3	0.001
General health	136.28	12	0.001
Type of insurance	461.54	6	0.001
Managed care	37.94	3	0.001
New/experienced beneficiary	3.88	3	n.s.
Any institutional utilization[1]	110.31	3	0.001
Any Part B claim[1]	355.89	3	0.001
Total covered charges[1]	381.88	9	0.001
Total reimbursed dollars[1]	391.32	9	0.001
Covered institutional charges[1]	118.90	9	0.001
Allowed Part B charges[1]	402.02	9	0.001

See notes at end of table.   (continued)

Table A-25 (continued)

Variable	Chi-Square Value	Degrees of Freedom	P-Value
Proxy Interviews			
Gender	2.73	3	n.s.
Education	37.21	6	0.001
Age category	33.82	6	0.001
Aged/disabled status	32.84	3	0.001
Income category	67.49	3	0.001
Race (white/nonwhite)	58.83	3	0.001
General health	19.23	12	n.s.
Type of insurance	84.71	6	0.001
Managed care	2.89	3	n.s.
New/experienced beneficiary[2]	--	--	--
Any institutional utilization[1]	15.27	3	0.002
Any Part B claim[1]	21.98	3	0.001
Total covered charges[1]	32.03	9	0.001
Total reimbursed dollars[1]	32.08	9	0.001
Covered institutional charges[1]	26.01	9	0.002
Allowed Part B charges[1]	34.14	9	0.001

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

[2] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

Table A-26. Coefficient Alphas of the Eight-Item Quiz, by Experience with the Medicare System

Interview Type	New	Experienced
Sample Member	0.73	0.76
Proxy[1]	--	0.79

[1] Because of the very small sample size of proxy respondents with no experience with the Medicare system, coefficient alphas were not calculated for this group.

Table A-27. Coefficient Alphas of the Eight-Item Quiz, by Enrollment in Managed Care, Institutional Utilization, and Part B Utilization

	None	Some
Managed Care		
Sample Member Interviews	0.77	0.72
Proxy Interviews	0.79	0.77
Institutional Utilization [1]		
Sample Member Interviews	0.77	0.76
Proxy Interviews	0.79	0.79
Part B Utilization [1]		
Sample Member Interviews	0.76	0.80
Proxy Interviews	0.80	0.79

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-28. Coefficient Alphas of the Eight-Item Quiz by Total Covered Charges, Total Reimbursed Dollars, and Total Institutional Charges

	$0	$1 - $499	$500 - $4,999	$5,000 or More
Total Covered Charges [1]				
Sample Member Interviews	0.80	0.76	0.75	0.77
Proxy Interviews	0.80	0.75	0.79	0.80
Total Reimbursed Dollars [1]				
Sample Member Interviews	0.79	0.75	0.76	0.78
Proxy Interviews	0.79	0.76	0.81	0.80
Total Institutional Charges [1]				
Sample Member Interviews	0.77	0.76	0.76	0.77
Proxy Interviews	0.79	0.78	0.79	0.80

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-29. Coefficient Alphas of the Eight-Item Quiz by Allowed Part B Charges [1]

Interview Type	$0	$1 - $499	$500 - $1,499	$1,500 or More
Sample Member	0.80	0.76	0.75	0.77
Proxy	0.80	0.76	0.80	0.80

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table A-30. Results from Statistical Analysis of Eight-Item Quiz

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Sample Member Interviews			
Gender	-5.32	13060	< 0.001
Education	407.17	2, 13059	< 0.001
Age category	166.46	2, 13059	< 0.001
Aged/disabled status	12.97	13060	< 0.001
Income category	-23.29	13060	< 0.001
Race (white/nonwhite)	18.91	13002	< 0.001
General health	86.45	4,13035	< 0.001
Type of insurance	241.16	2, 13059	< 0.001
Managed care	-22.39	13060	< 0.001
New/experienced beneficiary	-1.91	185	n.s.
Any institutional utilization [1]	-0.14	10663	n.s.
Any Part B claim [1]	-9.21	10662	< 0.001
Total covered charges [1]	29.22	3, 10660	< 0.001
Total reimbursed dollars [1]	25.44	3, 10639	< 0.001
Covered institutional charges [1]	3.45	3, 10660	0.016
Allowed Part B charges [1]	32.26	3, 10660	< 0.001
Proxy Interviews			
Gender [t]	-0.97	1468	n.s.
Education	25.54	2, 1467	< 0.001
Age category	2.63	2, 1467	n.s.
Aged/disabled status	2.53	1468	0.012
Income category	-8.21	1468	< 0.001

See notes at end of table.   (continued)

Table A-30 (continued)

Variable	t- or F-Statistic	Degrees of Freedom	P-Value
Proxy Interviews (con.)			
Race (white/nonwhite)	8.69	1465	< 0.001
General health	3.65	4, 1458	0.006
Type of insurance	46.48	2, 1467	< 0.001
Managed care	-5.01	1468	< 0.001
New/experienced beneficiary [2]	--	--	--
Any institutional utilization [1]	1.31	1288	n.s.
Any Part B claim [1]	-3.47	1288	0.001
Total covered charges [1]	3.51	3, 1286	0.015
Total reimbursed dollars [1]	3.57	3, 1277	0.014
Covered institutional charges [1]	1.06	3, 1286	n.s.
Allowed Part B charges [1]	5.15	3, 1286	0.002

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

[2] Because of the very small sample size of proxy respondents with no experience with the Medicare system, coefficient alphas were not calculated for this group.

Appendix B

**Psychometric Analyses of
Need-for-Information Index**

List of Tables in Appendix B

List of Tables in Appendix B (continued)

Appendix B: Need for Information Index

The 1995, 1996, and 1997 administrations of the Medicare Current Beneficiary Survey (MCBS) included six questions that were investigated as possible indicators of beneficiary knowledge. These questions were designed to assess need for information about specific topics. Beneficiaries were asked whether they needed to find information about six areas:

- how to find a doctor who accepts Medicare assignment,
- new benefits or changes in the Medicare program,
- medical services that Medicare does and does not cover,
- what a Medigap (or supplemental insurance policy) covers,
- how much to pay for a particular service, and
- the availability and benefits of health maintenance organizations (HMOs).

One sample question is listed below.

In the past year, have you needed information about how to find a doctor who accepts Medicare assignment?

- Yes
- No

In contrast to the other knowledge scales described in this report, respondents with more knowledge of the Medicare system were expected to have lower scores on the need for information index. Each of the six need-for-information questions were recoded so that a score of "0" represented a "No" response and "1" represented a "Yes" response. The overall need for information index was computed by summing the responses to the six questions. For example, if a respondent answered "Yes" to two of the need-for-information questions, this respondent's need for information could be calculated like the following example:

$$0 + 0 + 0 + 0 + 1 + 1 = 2.$$

Creating the scores in this manner allows for meaningful interpretations of the scores. Specifically, the score represents the number of topics for which the respondent reported needing more information. For example, in this calculation, the respondent received a score of 2, indicating that he/she had two topics for which more information was needed. This scoring system provides seven different possible scores (0-6) with higher scores indicating a greater need for information than lower scores. Also, change scores may be created by subtracting need-for-information scores from subsequent years from the baseline year: a positive change score would indicate an increase in need for information, and a negative change score would indicate a decline in need for information.

If a respondent answered at least half of the need for information items, then the need-for-information score was calculated by summing the items. However, if a respondent had missing data for more than half of the items, then the entire need-for-information index was recoded as missing.

The psychometric properties for the need-for-information index were evaluated using the same criterion as the other knowledge indices. Specifically, descriptive statistics were calculated for the scale. The reliability of the scale was assessed using Cronbach's alpha as a measure of internal consistency reliability. Additionally, comparisons of the scores between groups known to differ in their knowledge of Medicare were used to evaluate the construct validity of the scale. Finally, the need for information index was correlated with the other proposed knowledge scales to further investigate construct validity.

B.1 Descriptive Statistics. The need-for-information index has scores ranging from 0 to 6. Table B.1 displays descriptive statistics for this index at each time point. Information is presented separately for sample member and proxy respondents. Overall, the mean need for information scores for these two groups was similar at each time point.

The median and mode of this index both had values of 0 at each time point, suggesting that the distribution of index scores was very positively skewed. The large majority of respondents had scores of 0 on this index. Among sample members, 80% of respondents in 1995 and 82% in 1996 and 1997 received scores of 0 on this index. Also, 81% of proxy respondents in 1995 and 82% of proxy respondents in 1996 and 1997 received scores of 0. The skewness of the distribution and the lack of variability in scores limited the amount of information that this scale could provide.

Item-total score correlations for the need for information items are presented in Table B.2. Three of the items had substantial correlations (> 0.30). Two of the items (finding a doctor who accepts Medicare, and the availability and benefits of HMOs) had the lowest correlations (r = 0.15), suggesting that these items were not as related to the scale as the other items.

B.2 Reliability. Coefficient alphas for the need-for-information index were computed for each time point; these values are presented in Table B.3. Given that the need for information scale contains only six items and that most of the coefficient alphas were above or close to 0.50, this scale appears to have promising internal consistency for a scale under development.

Next, coefficient alphas of the need-for-information index were calculated separately for the various subgroups described earlier in this report. These results are presented in Tables B.4 through B.11. Overall, it appears that the coefficient alphas were similar across the various

groups, suggesting that the psychometric properties of the need for information scale remained consistent across the groups.

B.3 Validity. In an effort to gather evidence for the validity of the need-for-information scale, possible relationships between need-for-information scores and several variables that are hypothesized to be related to need for information were investigated. ANOVAs and t-tests were used to compare the average need-for-information scores of respondents from different groups.

In contrast to the other knowledge scales, respondents with more knowledge of the Medicare system were expected to have lower scores on the need-for-information index. It was anticipated that individuals with more knowledge would not need as much information as those with less knowledge. The results of these analyses are presented in Tables B.12 through B.27. Although responses sometimes varied for a particular year, the following general findings appeared to be consistent across the three time points.

B.3.1 Sample Member Interviews

Sample member respondents' need for information differed on several of the demographic variables. Overall, among sample member respondents, a higher need for information was reported by

- younger respondents (under 65 years of age),
- respondents with higher education,
- respondents with worse self-reported health status,
- respondents who had been enrolled in managed care during the past year,
- respondents with Medicare only, and
- respondents who were eligible for Medicare because of a disability.

Sample member respondents also differed in their need for information based on their health care utilization. The following groups reported a significantly higher need for information:

- respondents with some institutional utilization,
- respondents with some Part B utilization,
- respondents with more total covered charges,
- respondents with a higher amount of total reimbursed dollars,
- respondents with higher institutional charges, and
- respondents with a larger amount of Part B charges.

B.3.2 Proxy Interviews

Among proxy respondents, higher need-for-information scores were reported by

- respondents with higher income, and
- respondents with a larger amount of Part B charges.

B.4 Relationship with Other Scales.

To obtain further information concerning the construct validity of the need-for-information index, this scale was correlated with the Medicare understandability question, the four-item quiz, and the know-all-need-to-know index; these values are presented in Table B.28. The data from 1996 was used because all four of these scales were administered during that year. All of these correlations have values close to zero, suggesting that these scales are unrelated. Therefore, it appears that the need-for-information index is measuring a different construct than the other scales.

B.5 Conclusions and Discussion.

The results of these psychometric analyses revealed several shortcomings of the need for information index with respect to its use as a measure of beneficiary knowledge. For example, the need-for-information index should theoretically have had large variation in scores because there was a possibility of seven different scores (0-6). However, the data suggest that the content of these questions may not have been relevant to most of the sample. In 1995, 80% of beneficiaries indicated no need for information across all six of the topics. This means that 80% of the beneficiaries received the lowest score on the need-for-information index and the other 20% got higher scores. Therefore, this index was only able to discriminate among a small portion (e.g., 20%) of the sample and would only detect improvement in this small portion of the sample.

Additionally, the results of the validity analyses of the need for information scale seemed contradictory to the expected results for a knowledge index. If it is assumed that the need for information index is measuring knowledge, then individuals with higher need for information scores would be expected to have less knowledge of the Medicare system and those with lower need for information scores would have more knowledge. For example, it would be expected that individuals with higher education levels would be better able to understand the Medicare system and therefore would have greater knowledge and a lower need for information. However, the results indicate the exact opposite; those with more education reported a higher need for information than those with lower education levels. These results suggest that the need-for-information index is not in fact measuring knowledge. This conclusion is confirmed by the

results of the correlations with the other knowledge scales, which suggest that the need-for-information index is not measuring the same construct as the other scales.

These results may be explained, however, if we assume that the need-for-information index is measuring an individual's level of interest in receiving additional information on particular aspects of Medicare rather than his/her actual knowledge of these areas. For example, even though it may be expected that those who are enrolled in an HMO would be more knowledgeable about HMOs than those not enrolled, the data from the MCBS indicates that individuals who had been enrolled in managed care during the past year were significantly more likely to report needing information on HMOs than those who had not been enrolled in managed care (1995: $\chi^2(1)=485.78$, p=.001; 1996: $\chi^2(1)=368.85$, p=.001; 1997: $\chi^2(1)=547.77$, p=.001).

Similarly, individuals who use the Medicare system more may encounter more difficulties with the system and have more opportunities to use additional knowledge than those who use the system less often. Therefore, these individuals would be more compelled to find out additional information about the system. This explanation seems to hold across the validity analyses. For example, respondents who had some institutional utilization or Part B utilization reported a greater need for information than those with no utilization. This result is also consistent for the amount of allowable and reimbursed charges that may be considered measures of amount of service utilization. For total covered charges, total reimbursed dollars, covered institutional charges, and allowed Part B charges, respondents with higher charges had a greater need for information than those with lower or no charges.

Finally, this interpretation also seems reasonable given the results indicating that beneficiaries with more education reported needing more information than those with lower levels of education although research suggests that these individuals tend to be more knowledgeable. Generally, individuals with higher education tend to be more proactive consumers and therefore would be more interested in additional information, even if they are already knowledgeable.

This explanation suggests that the need-for-information index may not in fact measure knowledge of the Medicare system, but rather a desire for more information. Based on these results, it is recommended that the need-for-information index should not be used to measure beneficiary knowledge. However, this index may provide useful information on beneficiaries' interest in receiving additional information on particular aspects of the Medicare system.

Table B-1. Descriptive Statistics of Need-for-Information Scores

Interview Type/Survey Year	N	Mean	S.D.	Median	Mode
Sample Member Interviews					
1995 (Round 14)	11,710	0.31	0.72	0.00	0.00
1996 (Round 17)	11,947	0.26	0.64	0.00	0.00
1997 (Round 20)	12,584	0.26	0.66	0.00	0.00
Proxy Interviews					
1995 (Round 14)	1,569	0.31	0.75	0.00	0.00
1996 (Round 17)	1,461	0.28	0.71	0.00	0.00
1997 (Round 20)	1,546	0.27	0.65	0.00	0.00

Table B-2. Item-Total Score Correlations for the Need-for-Information Items

Need Information on:	Sample Member Interviews			Proxy Interviews		
	1995	1996	1997	1995	1996	1997
New benefits or changes in Medicare	0.32	0.30	0.31	0.28	0.35	0.31
Finding a doctor who accepts Medicare	0.21	0.14	0.15	0.10	0.22	0.22
What Medigap insurance covers	0.29	0.27	0.26	0.26	0.39	0.29
Availability and benefits of HMOs	0.14	0.12	0.15	0.15	0.12	0.10
How much to pay for a particular service	0.34	0.27	0.30	0.30	0.33	0.38
Services that Medicare covers	0.39	0.34	0.35	0.35	0.43	0.36

Table B-3. Coefficient Alphas of the Need-for-Information Index at Each Time Point

Interview Type/Survey Year	Alpha
Sample Member Interviews	
1995 (Round 14)	0.49
1996 (Round 17)	0.48
1997 (Round 20)	0.53
Proxy Interviews	
1995 (Round 14)	0.53
1996 (Round 17)	0.56
1997 (Round 20)	0.43

Table B-4. Coefficient Alphas of the Need-for-Information Index, by Experience with the Medicare System

Interview Type/Survey Year	New	Experienced
Sample Member Interviews		
1995 (Round 14)	0.40	0.47
1996 (Round 17)	0.28	0.46
1997 (Round 20)	0.19	0.52
Proxy Interviews[1]		
1995 (Round 14)	--	0.49
1996 (Round 17)	--	0.55
1997 (Round 20)	--	0.41

[1] Because of the very small sample size of proxy respondents with no experience with the Medicare system, coefficient alphas were not calculated for this group.

Table B-5. Coefficient Alphas of the Need-for-Information Index, by Enrollment in Managed Care

Interview Type/Survey Year	No Enrollment	Some Enrollment
Sample Member Interviews		
1995 (Round 14)	0.50	0.48
1996 (Round 17)	0.42	0.48
1997 (Round 20)	0.53	0.54
Proxy Interviews		
1995 (Round 14)	0.70	0.49
1996 (Round 17)	0.58	0.16
1997 (Round 20)	0.44	0.42

Table B-6. Coefficient Alphas of the Need-for-Information Index, by Institutional Utilization [1]

Interview Type/Survey Year	No Utilization	Some Utilization
Sample Member Interviews		
1995 (Round 14)	0.49	0.50
1996 (Round 17)	0.46	0.50
1997 (Round 20)	0.53	0.53
Proxy Interviews		
1995 (Round 14)	0.53	0.46
1996 (Round 17)	0.61	0.57
1997 (Round 20)	0.53	0.40

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-7. Coefficient Alphas of the Need-for-Information Index, by Part B Utilization[1]

Interview Type/Survey Year	No Utilization	Some Utilization
Sample Member Interviews		
1995 (Round 14)	0.45	0.50
1996 (Round 17)	0.49	0.48
1997 (Round 20)	0.54	0.53
Proxy Interviews		
1995 (Round 14)	0.71	0.45
1996 (Round 17)	0.61	0.58
1997 (Round 20)	0.35	0.44

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-8. Coefficient Alphas of the Need-for-Information Index, by Total Covered Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1995 (Round 14)	0.48	0.53	0.45	0.54
1996 (Round 17)	0.50	0.48	0.46	0.51
1997 (Round 20)	0.59	0.51	0.54	0.53
Proxy Interviews				
1995 (Round 14)	0.69	0.41	0.53	0.37
1996 (Round 17)	0.58	0.65	0.50	0.63
1997 (Round 20)	0.25	0.59	0.36	0.41

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-9. Coefficient Alphas of the Need-for-Information Index, by Total Reimbursed Dollars[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1995 (Round 14)	0.49	0.50	0.51	0.47
1996 (Round 17)	0.45	0.50	0.47	0.51
1997 (Round 20)	0.60	0.48	0.55	0.54
Proxy Interviews				
1995 (Round 14)	0.64	0.30	0.57	0.27
1996 (Round 17)	0.74	0.51	0.54	0.59
1997 (Round 20)	0.31	0.51	0.33	0.44

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-10. Coefficient Alphas of the Need-for-Information Index, by Total Institutional Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More
Sample Member Interviews				
1995 (Round 14)	0.49	0.46	0.50	0.54
1996 (Round 17)	0.46	0.51	0.47	0.50
1997 (Round 20)	0.53	0.47	0.56	0.54
Proxy Interviews				
1995 (Round 14)	0.53	0.47	0.55	0.28
1996 (Round 17)	0.61	0.54	0.54	0.61
1997 (Round 20)	0.53	0.19	0.35	0.46

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-11. Coefficient Alphas of the Need-for-Information Index, by Allowed Part B Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $1,499	$1,500 or More
Sample Member Interviews				
1995 (Round 14)	0.49	0.52	0.48	0.50
1996 (Round 17)	0.48	0.47	0.49	0.49
1997 (Round 20)	0.58	0.51	0.56	0.51
Proxy Interviews				
1995 (Round 14)	0.68	0.39	0.47	0.49
1996 (Round 17)	0.59	0.55	0.55	0.63
1997 (Round 20)	0.35	0.53	0.35	0.41

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-12. Mean (and Standard Deviation) of Need-for-Information Scores, by Gender

Interview Type/Survey Year	Female	Male	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.31 (0.71)	0.31 (0.72)	$t (11708) = -0.57$, n.s.
1996 (Round 17)	0.26 (0.65)	0.26 (0.64)	$t (11945) = 0.37$, n.s.
1997 (Round 20)	0.26 (0.66)	0.27 (0.67)	$t (12582) = -0.71$, n.s.
Proxy Interviews			
1995 (Round 14)	0.32 (0.75)	0.30 (0.75)	$t (1567) = 0.51$, n.s.
1996 (Round 17)	0.27 (0.71)	0.28 (0.70)	$t (1459) = -0.39$, n.s.
1997 (Round 20)	0.29 (0.67)	0.25 (0.64)	$t (1544) = 1.08$, n.s.

Table B-13. Mean (and Standard Deviation) of Need-for-Information Scores, by Race

Interview Type/Survey Year	White	Nonwhite	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.32 (0.71)	0.29 (0.73)	t (11708) = 1.56, n.s.
1996 (Round 17)	0.26 (0.64)	0.24 (0.67)	t (11945) = 1.43, n.s.
1997 (Round 20)	0.27 (0.67)	0.23 (0.64)	t (12582) = 2.48, p = .013
Proxy Interviews			
1995 (Round 14)	0.33 (0.76)	0.25 (0.73)	t (1567) = -0.69, p = .037
1996 (Round 17)	0.29 (0.70)	0.25 (0.72)	t (1459) = 0.91, n.s.
1997 (Round 20)	0.28 (0.66)	0.24 (0.63)	t (1544) = 1.23, n.s.

Table B-14. Mean (and Standard Deviation) of Need-for-Information Scores, by Income

Interview Type/Survey Year	Under $25,000	$25,000 or More	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.30 (0.71)	0.35 (0.74)	t (11708) = -0.69, p = .000
1996 (Round 17)	0.25 (0.64)	0.29 (0.66)	t (11945) = -3.30, p = .001
1997 (Round 20)	0.26 (0.66)	0.27 (0.66)	t (12582) = -0.72, n.s.
Proxy Interviews			
1995 (Round 14)	0.29 (0.74)	0.42 (0.82)	t (1567) = -2.46, p =.014
1996 (Round 17)	0.25 (0.67)	0.45 (0.88)	t (1459) = -3.98, p = .000
1997 (Round 20)	0.25 (0.64)	0.34 (0.71)	t (1544) = -1.99, p = .046

Table B-15. Mean (and Standard Deviation) of Need-for-Information Scores, by Age

Interview Type/Survey Year	Under 65	65-75	Over 65	F Statistic
Sample Member Interviews				
1995 (Round 14)	0.48 (0.95)	0.31 (0.71)	0.25 (0.62)	$F (2, 11707) = 68.36, p = .000$
1996 (Round 17)	0.38 (0.82)	0.27 (0.65)	0.20 (0.56)	$F (2, 11944) = 50.54, p = .000$
1997 (Round 20)	0.36 (0.81)	0.28 (0.68)	0.22 (0.58)	$F (2, 12581) = 34.72, p = .000$
Proxy Interviews				
1995 (Round 14)	0.26 (0.73)	0.36 (0.81)	0.31 (0.73)	$F (2, 1566) = 1.73$, n.s.
1996 (Round 17)	0.24 (0.66)	0.29 (0.70)	0.30 (0.74)	$F (2, 1458) = 1.23$, n.s.
1997 (Round 20)	0.24 (0.66)	0.27 (0.61)	0.28 (0.66)	$F (2, 1543) = 0.46$, n.s.

Table B-16. Mean (and Standard Deviation) of Need-for-Information Scores, by Education

Interview Type/Survey Year	8th Grade or Less	More Than 8th Grade, No College	College	F Statistic
Sample Member Interviews				
1995 (Round 14)	0.22 (0.62)	0.30 (0.70)	0.41 (0.81)	$F (2, 11707) = 49.18, p = .000$
1996 (Round 17)	0.17 (0.54)	0.24 (0.62)	0.35 (0.75)	$F (2, 11944) = 61.27, p = .000$
1997 (Round 20)	0.19 (0.56)	0.26 (0.65)	0.33 (0.74)	$F (2, 12581) = 37.35, p = .000$
Proxy Interviews				
1995 (Round 14)	0.25 (0.67)	0.33 (0.77)	0.46 (0.93)	$F (2, 1566) = 7.29, p = .001$
1996 (Round 17)	0.26 (0.72)	0.27 (0.66)	0.33 (0.79)	$F (2, 1458) = 0.72$, n.s.
1997 (Round 20)	0.22 (0.60)	0.29 (0.67)	0.36 (0.74)	$F (2, 1543) = 4.31, p = .014$

Table B-17. Mean (and Standard Deviation) of Need-for-Information Scores, by Health Status

Interview Type/Survey Year	Poor	Fair	Good	Very Good	Excellent	F Statistic
Sample Member Interviews						
1995 (Round 14)	0.47 (0.91)	0.35 (0.79)	0.29 (0.68)	0.28 (0.65)	0.28 (0.67)	$F (4, 11682) = 17.44$, $p = .000$
1996 (Round 17)	0.38 (0.80)	0.28 (0.68)	0.24 (0.62)	0.23 (0.59)	0.25 (0.63)	$F (4, 11924) = 12.09$, $p = .000$
1997 (Round 20)	0.37 (0.80)	0.30 (0.71)	0.26 (0.67)	0.24 (0.63)	0.20 (0.55)	$F (4, 12566) = 13.13$, $p = .000$
Proxy Interviews						
1995 (Round 14)	0.38 (0.90)	0.36 (0.77)	0.27 (0.73)	0.27 (0.67)	0.23 (0.61)	$F (4, 1559) = 2.12$, n.s.
1996 (Round 17)	0.33 (0.84)	0.26 (0.67)	0.28 (0.71)	0.34 (0.67)	0.29 (0.64)	$F (4, 1452) = 0.67$, n.s.
1997 (Round 20)	0.23 (0.56)	0.37 (0.76)	0.25 (0.63)	0.22 (0.63)	0.23 (0.59)	$F (4, 1535) = 3.30$, $p = .011$

Table B-18. Mean (and Standard Deviation) of Need-for-Information Scores, by Type of Insurance

Interview Type/Survey Year	Medicare Only	Medicare and Private	Medicare and Medicaid/Public	F Statistic
Sample Member Interviews				
1995 (Round 14)	0.36 (0.82)	0.31 (0.70)	0.27 (0.68)	$F (2, 11707) = 8.71$, $p = .000$
1996 (Round 17)	0.28 (0.68)	0.26 (0.65)	0.21 (0.58)	$F (2, 11944) = 7.79$, $p = .000$
1997 (Round 20)	0.29 (0.68)	0.27 (0.67)	0.21 (0.59)	$F (2, 12581) = 9.78$, $p = .000$
Proxy Interviews				
1995 (Round 14)	0.32 (0.80)	0.34 (0.74)	0.26 (0.73)	$F (2, 1566) = 1.51$, n.s.
1996 (Round 17)	0.25 (0.63)	0.28 (0.67)	0.28 (0.79)	$F (2, 1458) = 0.26$, n.s.
1997 (Round 20)	0.34 (0.74)	0.32 (0.69)	0.16 (0.51)	$F (2, 1543) = 11.77$, $p = .000$

Table B-19. Mean (and Standard Deviation) of Need-for-Information Scores, by Enrollment in Managed Care

Interview Type/Survey Year	No Enrollment	Some Enrollment	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.30 (0.71)	0.39 (0.77)	t (11706) = -4.12, p = .000
1996 (Round 17)	0.25 (0.64)	0.30 (0.65)	t (11945) = -2.72, p = .007
1997 (Round 20)	0.26 (0.66)	0.30 (0.66)	t (12582) = -2.92, p = .004
Proxy Interviews			
1995 (Round 14)	0.29 (0.72)	0.53 (1.05)	t (1567) = -2.97, p = .003
1996 (Round 17)	0.27 (0.70)	0.39 (0.74)	t (1459) = -1.92, n.s.
1997 (Round 20)	0.25 (0.63)	0.42 (0.77)	t (1544) = -3.33, p = .001

Table B-20. Mean (and Standard Deviation) of Need-for-Information Scores, by Medicare Enrollment Status

Interview Type/Survey Year	Aged	Disabled	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.28 (0.67)	0.48 (0.95)	t (11708) = -10.77, p = .000
1996 (Round 17)	0.24 (0.61)	0.38 (0.82)	t (11945) = -8.46, p = .000
1997 (Round 20)	0.25 (0.63)	0.36 (0.81)	t (12582) = -6.70, p = .000
Proxy Interviews			
1995 (Round 14)	0.33 (0.76)	0.26 (0.73)	t (1567) = 1.61, n.s.
1996 (Round 17)	0.30 (0.73)	0.23 (0.65)	t (1459) = 1.80, n.s.
1997 (Round 20)	0.28 (0.65)	0.24 (0.66)	t (1544) = 0.92, n.s.

Table B-21. Mean (and Standard Deviation) of Need-for-Information Scores, by Experience with the Medicare System

Interview Type/Survey Year	New	Experienced	t statistic
Sample Member Interviews			
1995 (Round 14)	0.31	0.22	t (184) = 0.97, n.s.
1996 (Round 17)	0.28	0.26	t (187) = 0.23, n.s.
1997 (Round 20)	0.28	0.41	t (195) = -1.02, n.s.

[1] Because of the small sample size of proxy respondents who were new to the Medicare system, comparisons between new and experienced proxy respondents were not conducted.

Table B-22. Mean (and Standard Deviation) of Need-for-Information Scores, by Institutional Utilization[1]

Interview Type/Survey Year	Some Utilization	No Utilization	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.31 (0.73)	0.28 (0.68)	t (10448) = 2.43, p = .015
1996 (Round 17)	0.27 (0.66)	0.23 (0.61)	t (10340) = 2.93, p = .003
1997 (Round 20)	0.27 (0.68)	0.23 (0.62)	t (10514) = 2.92, p = .004
Proxy Interviews			
1995 (Round 14)	0.31 (0.74)	0.27 (0.69)	t (1470) = 1.07, n.s.
1996 (Round 17)	0.28 (0.70)	0.25 (0.70)	t (1331) = 0.71, n.s.
1997 (Round 20)	0.27 (0.63)	0.21 (0.64)	t (1368) = 1.52, n.s.

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-23. Mean (and Standard Deviation) of Need-for-Information Scores, by Part B Utilization[1]

Interview Type/Survey Year	No Utilization	Some Utilization	t Statistic
Sample Member Interviews			
1995 (Round 14)	0.22 (0.62)	0.31 (0.72)	$t (10448) = -4.18$, $p = .000$
1996 (Round 17)	0.18 (0.56)	0.26 (0.65)	$t (10340) = -3.48$, $p = .001$
1997 (Round 20)	0.18 (0.56)	0.26 (0.67)	$t (10514) = -3.78$, $p = .000$
Proxy Interviews			
1995 (Round 14)	0.18 (0.64)	0.31 (0.74)	$t (1470) = -2.64$, $p = .008$
1996 (Round 17)	0.17 (0.59)	0.28 (0.72)	$t (1331) = -2.24$, $p = .025$
1997 (Round 20)	0.18 (0.60)	0.26 (0.64)	$t (1368) = -1.66$, n.s.

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-24. Mean (and Standard Deviation) of Need-for-Information Scores, by Total Covered Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More	F Statistic
Sample Member Interviews					
1995 (Round 14)	0.24 (0.65)	0.27 (0.69)	0.29 (0.67)	0.37 (0.80)	$F (3, 10446) = 13.61$, $p = .000$
1996 (Round 17)	0.20 (0.58)	0.22 (0.59)	0.26 (0.64)	0.30 (0.71)	$F (3, 10338) = 8.60$, $p = .000$
1997 (Round 20)	0.20 (0.60)	0.23 (0.62)	0.26 (0.67)	0.29 (0.70)	$F (3, 10512) = 6.31$, $p = .000$
Proxy Interviews					
1995 (Round 14)	0.19 (0.65)	0.27 (0.67)	0.38 (0.82)	0.28 (0.69)	$F (3, 1468) = 3.96$, $p = .008$
1996 (Round 17)	0.17 (0.60)	0.25 (0.72)	0.27 (0.64)	0.32 (0.79)	$F (3, 1329) = 2.00$, n.s.
1997 (Round 20)	0.16 (0.56)	0.20 (0.61)	0.22 (0.58)	0.34 (0.70)	$F (3, 1366) = 5.13$, $p = .002$

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-25. Mean (and Standard Deviation) of Need-for-Information Scores, by Total Reimbursed Dollars[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More	F Statistic
Sample Member Interviews					
1995 (Round 14)	0.26 (0.68)	0.27 (0.67)	0.31 (0.72)	0.37 (0.78)	$F (3, 10437) = 8.99, p = .000$
1996 (Round 17)	0.20 (0.57)	0.23 (0.62)	0.26 (0.65)	0.30 (0.72)	$F (3, 10319) = 7.45, p = .000$
1997 (Round 20)	0.21 (0.61)	0.23 (0.61)	0.28 (0.69)	0.29 (0.70)	$F (3, 10485) = 7.39, p = .000$
Proxy Interviews					
1995 (Round 14)	0.25 (0.71)	0.27 (0.66)	0.38 (0.83)	0.26 (0.68)	$F (3, 1464) = 2.84, p = .037$
1996 (Round 17)	0.20 (0.67)	0.26 (0.69)	0.27 (0.68)	0.32 (0.76)	$F (3, 1324) = 1.22$, n.s.
1997 (Round 20)	0.16 (0.54)	0.22 (0.63)	0.22 (0.57)	0.37 (0.74)	$F (3, 1360) = 6.13, p = .000$

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-26. Mean (and Standard Deviation) of Need-for-Information Scores, by Total Institutional Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $4,999	$5,000 or More	F Statistic
Sample Member Interviews					
1995 (Round 14)	0.28 (0.68)	0.26 (0.65)	0.31 (0.72)	0.38 (0.81)	$F (3, 10446) = 11.45, p = .000$
1996 (Round 17)	0.23 (0.60)	0.25 (0.64)	0.25 (0.63)	0.30 (0.71)	$F (3, 10338) = 5.69, p = .001$
1997 (Round 20)	0.23 (0.62)	0.23 (0.60)	0.29 (0.71)	0.29 (0.71)	$F (3, 10512) = 7.52, p = .000$
Proxy Interviews					
1995 (Round 14)	0.27 (0.69)	0.31 (0.78)	0.40 (0.81)	0.25 (0.66)	$F (3, 1468) = 2.63, p = .049$
1996 (Round 17)	0.25 (0.70)	0.20 (0.56)	0.32 (0.70)	0.30 (0.78)	$F (3, 1329) = 1.53$, n.s.
1997 (Round 20)	0.21 (0.64)	0.22 (0.55)	0.20 (0.54)	0.34 (0.71)	$F (3, 1366) = 4.01, p = .008$

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-27. Mean (and Standard Deviation) of Need-for-Information Scores, by Allowed Part B Charges[1]

Interview Type/Survey Year	$0	$1 - $499	$500 - $1,499	$1,500 or More	F Statistic
Sample Member Interviews					
1995 (Round 14)	0.24 (0.66)	0.28 (0.69)	0.29 (0.68)	0.36 (0.78)	F (3, 10446) = 10.92, p = .000
1996 (Round 17)	0.19 (0.57)	0.22 (0.60)	0.25 (0.64)	0.31 (0.71)	F (3, 10338) = 13.32, p = .000
1997 (Round 20)	0.21 (0.61)	0.23 (0.62)	0.27 (0.69)	0.29 (0.69)	F (3, 10512) = 7.15, p = .000
Proxy Interviews					
1995 (Round 14)	0.19 (0.65)	0.29 (0.70)	0.27 (0.64)	0.38 (0.83)	F (3, 1468) = 3.71, p = .011
1996 (Round 17)	0.16 (0.58)	0.25 (0.68)	0.25 (0.68)	0.36 (0.80)	F (3, 1329) = 3.77, p = .010
1997 (Round 20)	0.18 (0.59)	0.17 (0.54)	0.28 (0.65)	0.34 (0.70)	F (3, 1366) = 6.15, p = .000

[1] Only respondents who were not enrolled in managed care during the past year were included in these analyses.

Table B-28. Correlations of the Need-for-Information Index with Other Scales

Scale	Need for Information Index
Medicare Understandability Question	-0.06
Four-Item Quiz	0.04
Know-All-Need-to-Know Index	0.00