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BY MEDICARE BENEFICIARIES**

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ABSTRACT

This research examines the impact of Medicaid-Medicare dual eligibility on the pattern of health care service utilization by ethnic minorities. The Medical Expenditure Panel Survey 1996-2000 reveals that, as a whole, dual eligibility was strongly associated with high rate of home health provider days. The utilization of total dental visits was adversely correlated with dual eligibility. The impact of dual eligibility on the health care utilization was differentiated across ethnicity groups. With additional Medicaid coverage, Afro-Americans Medicare beneficiaries significantly increased the utilization of office-based physician visits, outpatient physician visits, and dental visits. Dual eligible Asians substantially increase their home health provider days and dental visits. Due to the additional coverage from Medicaid, Hispanics dramatically increase the utilization of outpatient physician visits.

JEL: I11,C25

Key words: Medicare beneficiary, dual eligibility, racial disparity, health care use

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IMPACT OF DUAL ELIGIBILITY ON HEALTHCARE USE BY MEDICARE BENEFICIARIES

Introduction

It has been an important financial issue in the U.S. Medicare system that health care expenses of Medicaid-Medicare dual eligibles (MMDE) are much higher than those of Medicare only beneficiaries (MOB). Total health expenditures for the Medicaid-Medicare dual eligibles are more than double those of the non-dual eligibles. In 1999, total annual health expenditures (including Medicare, Medicaid, private, and out-of-pocket spending) averaged \$16,278 for each dual eligible compared with \$7,396 on average for those who are not dually eligible.⁴ Dual eligibles, who are covered by both Medicare and Medicaid, represent only one-fifth of each program's enrollment, about 7 million in 1997, but account for a much larger share of each program's spending (Komisar et al., 2000).¹ In 1999, these dual eligibles accounted for about \$50 billion in Medicare expenditures (24 percent of total Medicare spending) and \$63 billion in Medicaid expenditures (35 percent of total Medicaid spending) nationwide, reflecting their relatively greater medical and long-term care demands.² The dual eligibles are the most costly population being served by publicly funded health care programs.³

According to Ryan and Super (2003)⁵, the dually eligible population is more likely to be disabled and either younger (under age 65) or older (over age 85) than the majority of Medicare beneficiaries. Over half of the dual eligibles are in fair or poor health, while only one quarter of non-dual eligibles are reported to be in fair or poor health. In particular, dual eligibles are more likely to suffer from chronic and serious health conditions such as diabetes, pulmonary disease, and stroke. More than 40 percent of dual eligibles have a cognitive or mental impairment, while only 9 percent of non-dually eligible Medicare beneficiaries have similar problem.⁶

Dual eligibles are culturally more diverse. Over 42 percent of dual eligibles represent minority populations, compared with 16 percent of non-dually eligible Medicare beneficiaries.⁷ As a patient's decision-making on the amount of health care he/she would utilize might depend on his/her cultural or racial background, it is important to understand racial differences in the health care service use among dual eligibles.

Known for their high cost and complex health needs, dually eligible individuals have been the center of debate in both programs with neither Medicare nor Medicaid wanting to take full responsibility to face the medical needs of the dual eligibles. Dual eligibles are still viewed as a heavy liability to public and private insurers.⁸ In spite of its importance in the efficient implementation of public health care system, only limited numbers of studies have been performed.

This paper intends to examine racial differences in utilization of health services for MMDEs and MOBs. Ethnicity is categorized into white, Afro-American, Hispanic, and Asian groups. In the estimation, we include various demographic characteristics such as age, gender, education, marital status, income, region, and Metropolitan Statistical Area (MSA) as determinants of health care uses. We employ zero-inflated negative binomial (ZINB) regressions to estimate the effect of dual eligibility on health care use by ethnic minorities with Medicare coverage.

Methods

Health care uses (y) we consider in this study have three fundamental statistical properties: (a) to be nonnegative ($y \geq 0$); (b) to have nontrivial fraction of zero outcomes in the population (and sample); and, subsequently, (c) to follow a positively-skewed empirical distribution of the

nonzero realizations. These unique data structures are encountered often in the health care utilization analysis. In the literature of this area, empirical investigations on such data structures typically rely on the following strategies.

Generalized Linear Model (GLM)

The generalized linear model fits an outcome (y) on exogenous covariates x as follows:

$$g(E(y)) = x\beta, y \sim F \quad (1)$$

where $g(\cdot)$ is called the link function and F denotes the distributional families. Substituting various specifications for $g(\cdot)$ and F results in an array of models. For instance, if we assume F to be a poisson distribution, it gives us a log linear model of a count data:

$$\ln(E(y)) = x\beta, y \sim \text{Poisson} \quad (2)$$

Poisson regression is a standard estimation method used for models of the number of occurrences (counts) of an event. The restrictive condition of the equality of mean and variance in the poisson distribution makes the negative binomial model preferred in the case where the sample is characterized by the prevalence of zero outcomes.

Two-Part Model (TPM)

The two-part model explicitly considers the overdispersion problem in the flexible specification. The data generating process is split into two regimes to allow different outcome determination for zero and nonzero realizations. Thus, one regime is a binomial probability model of $\Pr(y > 0 | x)$ governing the binary count outcome of whether to be zero or positive (Part 1). If the outcome is realized as positive, the conditional Poisson process is assumed to be truncated at zero (Part 2). Thus, the log-likelihood function to maximum likelihood (ML)

estimation of this model is composed of three likelihoods: probability of being zero, probability of being positive (both from Part 1) and conditional probability of being a positive value (from Part 2).

Zero-Inflated Poisson (ZIP)/Zero-Inflated Negative Binomial (ZINB) Model

The zero-inflated negative binomial (ZINB) is a modified count data model characterized as hybrid of the GLM and TPM.⁹ In the ZINB model, we assume that there is a parent distribution function for outcome realizations. As in the TPM, there are two data generating regimes in which the zero outcomes can realized from one of those regimes. In one regime, outcomes are always zero. In the second regime, outcomes are either zeros or nonzeros. Each regime is expressed as a weighted average of the parent density, using the relative probability of zero and nonzero outcomes as the weight parameter.¹⁰ The log-likelihood function is specified from two terms: probability of being zero, and probability of being positive counts. In the ZINB model, the mean and variance are no longer assumed to be equivalent as they were in the poisson model and the high frequency of zero outcomes does not cause any misspecification problem. Thus, we implement the ZINB model to understand the relationship between the number of visits to medical service sites a person makes and various explanatory factors such as his/her demographic, socioeconomic, medical conditions, and the accessibility to local health care facilities. The health care utilization variables are measured as frequencies of physician visits and provider days. The percent of individuals who made zero visits or used zero days of service are represented as 14.1%; 84.3%; 71.0%; and 88.5% in office-based, hospital outpatient, dental, and, home health settings, respectively. Our parent density of a count outcome y is expressed as:

$$\phi(y_i, \theta | X) = \phi(y_i, a + b_1 \cdot Z_i + b_2 \cdot Race_i + b_3 \cdot Dual_Eligible_i + b_4 \cdot (Race_i \times Dual_Eligible_i)) \quad (3)$$

where i denotes individuals; y_i represents various health care service demands (i.e., office-based physician visits, outpatient physician visits, dental visits, and agency-sponsored home health provider days). Z_i includes demographic explanatory variables (i.e., age, gender, marital status, education, employment, region, self-reported health, and number of co-morbidities). $Race_i$ is a binary indicator for being racial minorities like Afro American, Hispanic, and Asians. $Dual_Eligibles_i$ is a dummy variable indicating the dual eligibility status.

Data and Sample

The household component of the Medical Expenditure Panel Survey (MEPS) 1996-2000 is used for the analysis. The U.S. Agency for Health Care Policy and Research (AHCPR) and the National Center for Health Statistics (NCHS) collect the data to provide nationally representative estimates of health care use, expenditures, sources of payment, and insurance coverage for the U.S. civilian non-institutionalized population. The survey starts a new sample every year and follows each panel for two calendar years consecutively using three rounds a year. Hence, it is possible to determine how changes in respondents' health status, income, employment, eligibility for public and private insurance coverage, use of services, and payment for care are related.

Total 8,262 observations (out of total sample size) are reported as the Medicare beneficiaries in the MEPS 1996-2000. Medicare beneficiaries sample include individuals who are covered by Medicare *and* do not have private health insurance coverage during a given year. Utilization variables are measured as total number of visits in a calendar year such as office-based physician visits (OBDRV), outpatient physician visits (OPDRV), agency-sponsored home health provider days (HHAGD), and total dental visits (DVTOT).

Analysis Variables

Office-based visits: Office-based medical provider visits consist of encounters that took place primarily in office-based settings and clinics. Visits to other care provision settings are not included in this category: Specifically, if health services are provided in other settings such as a hospital, nursing home, or a person's homes, visits to them are not categorized as office-based visits. The total number of office-based visits (OBTOTV) as well as the number of visits to physicians (OBDRV) and non-physician providers (OBOTHV) is contained in the Medicare beneficiary sample of MEPS data observed from 1996 through 2000. Non-physician visits include visits to following providers: chiropractors, midwives, nurses and nurse practitioners, optometrists, podiatrists, physician's assistants, physical therapists, occupational therapists, psychologists, social workers, technicians, receptionists/clerks/secretaries, or other medical providers. The analysis focuses on the number of visits to physicians (OBDRV) because the vast majority of, over 90%, office-based visits are concentrated on physician providers during the observation period.

Hospital outpatient visits: The sample contains the variables of total number of visits to hospital outpatient departments (OPTOT) as well as the number of outpatient department visits to physicians (OPDRV) and non-physician providers (OPOTHV). The sum of the physician and non-physician visit variables (OPDRV) + OPOTHV) should be equal to the total number of outpatient visits variable (OPTOT). The number of outpatient department visits to physicians (OPDRV) is the variable selected for examining utilization patterns of outpatient department services.

Home Health Days: In contrast to other types of medical events where data were collected on a per visit basis, information on home health care utilization is collected on a per

month basis. Variables indicate total number of days in a year when home health care was delivered by one of the following providers: any type of paid or unpaid caregiver (HHTOTD), agencies/hospitals/nursing homes (HHAGD), self-employed persons (HHINDD), and unpaid informal caregivers not living with the same person (HHINFD).

The number of provider day represents total sum of the number of days across all providers and across months in a calendar year, on which home health care was received. For example, if a person received care in one month from one provider on two different days, then the number of provider days would equal two. The number of provider days would also equal two if a person received care from two different providers on the same day. However, if a person received care from one provider two times in the same day, then the provider days would equal one. Missing values were assigned to these variables if the number of provider days could not be computed for any month in which the type of home health care was received. The agency-sponsored home health provided days (HHAGD) variable summates the number of days when home health care were received from caregivers affiliated with agencies, hospitals, or nursing homes.

Dental Visits: The total number of visits for dental care (DVTOT) includes visits to any care provider(s) including general dentists, dental hygienists, dental technicians, dental surgeons, orthodontists, endodontists, and periodontists. Our data separately provides the numbers of dental visits to general dentists (DVGEN) and to orthodontists (DVORTH). For a small proportion of our sample, the sum of the general dentist and orthodontist visit variables (DVGEN + DVORTH) is greater than the total number of dental visits (DVTOT). This is the case because persons report to have one visit to each provider when they see both a general dentist and orthodontist in the same visit(s).

[Table One Placed Here]

The descriptive statistics for the sample of Medicare beneficiaries (MB) are documented in Table 2. Of the sample, the average age is 69.3; 41% of individuals are male; 41% are married; 53% have education of less than high school graduation; 27% of individuals live in rural areas. South, as a region of residence, represents the largest population 39%; West, 22%; Midwest, 19%; and Northeast, 19%.

According to the self-rated health measurement indicator, 36% of the sample suggests their self-evaluated health is in fair or poor state. About 48% of the sample individuals have chronic medical conditions such as diabetes, cancer, hypertension, heart failure, arthritis, depression, and other mental disorders. On average, individuals have about six co-morbid symptoms. Table 2 indicates that almost one out of four individuals is in poverty; only 11% of those still work as part-time or temporary workers. Hispanics and Afro-Americans represent 17% and 18% of the entire sample, respectively. We find that 23% of Medicare beneficiaries are also eligible for Medicaid programs, composing the dual eligible sample.

[Table Two Placed Here]

Table 3 reports demographic, socioeconomic, and health-related characteristics of the Medicare only beneficiaries (MOB) and Medicaid-Medicare dual eligibles (MMDE). The mean age of MOB is 70.9 while the mean age of MMDEs is 67.2. Compared with MOB, dual eligibles are likely to be younger (67.2 vs. 70.9), female (66.2% vs. 56.9%), unmarried (70.3%

vs. 53.5%), less educated (5.6% vs. 12.6%, college education and more), and likely to have a larger number of co-morbidities (5.5 vs. 5.4).

MMDEs are more likely to have medical conditions included in a predetermined priority list (priolist) such as hypertension, diabetes mellitus, cardiac problems, and arthritis, etc. On average, 50.2% of the MMDEs suffer from priority list conditions compared with 46.8% of MOBs to have chronic disease(s). Mean number of comorbidities among MMDEs is slightly larger (4.5) than that of MOBs (4.4). About 39.4% of dual eligibles have at least one limitation to individual activities of daily living (IADL). The percentage of individuals with at least one limitation to IADL is, however, only 28.5%. While about 30% of dual eligibles have limitation(s) to activities of daily living (ADL), only about 22.6% of Medicare only beneficiaries have difficulties in ADL. As a result, we find that MMDEs are more likely to suffer from chronic medical conditions and in general more likely to have “bad health” compared with their Medicare only counterparts.

[Table Three Placed Here]

Regarding socioeconomic conditions, Table 3 reveals that probability of being in poverty is much higher among MMDEs (41.1%, mean of three racial values) than among MOBs (18.9%). The percentage of individuals with income less than or equal to zero is 12.6% among MMDEs, which is almost double the percentage of the MOBs (6.21%). The personal annual income of the MMDEs (\$7,486.2) is lower than that of MOBs (\$15,298.7). These findings indicate that dual eligibles are more likely to be economically disadvantaged relative to Medicare only beneficiaries.

Results

Table 4 presents the logistic regression results on supplemental Medicaid coverage. The dependent variable for the first regression is whether a Medicare beneficiary carried Medicaid to supplement Medicare. The results show that over the years, all five demographic variables (age, gender, marriage, education, and metropolitan status) are correlated with the likelihood of being Medicaid-Medicare dual eligibles (MMDE). The older a person is, the more likely he or she has had dual coverage. Age was negatively associated with the probability of having dual coverage but positively associated with having Medicare coverage only.

Socioeconomic conditions were important in explaining the dual coverage. Poverty was positively related to the likelihood of being dual eligibles, other things being equal. Further investigation shows that employment was negatively related to the probability of being covered by the additional Medicaid coverage. “Bad health”, captured by “poor health”, “number of comorbidities”, and “chronic disease”, was positively associated with the likelihood of dual eligibility. Ethnic minorities such as Asian, Hispanic, and Afro-American were more likely to be dual eligibles. Among the ethnic minorities, Asians showed the highest likelihood of having dual coverage from both Medicare and Medicaid over the years from 1996 through 2000.

[Table Four Placed Here]

Table 5 reports the result for four different health care service uses; office-based physician visits, outpatient visits, agency-sponsored home health provider days, and total dental care visits. The zero-inflated negative binomial (ZINB) regression technique revealed the role of race and dual eligibility in health care utilization differences.

Impact on physician visits

Being Afro-American has positive significant effect on outpatient physician visits (column 2) but negative significant effect on office-based physician visits (column 1). Being Asian was positively correlated with outpatient visits but not significantly correlated with office-based visits. These results may be contributed to by differences in health care professionals' attitude towards racial minorities in hospital settings and individual health care sites. Individual health care professionals, particularly office-based physicians, are disproportionately represented by Caucasians (Lakhan, 2002).¹¹ Racial minorities often feel it hard to establish trustful relationships with physicians of different ethnic background (Atkin, 2003).¹² Formally organized hospital settings may work in diluting cultural unfamiliarity felt by racial minorities. There are some hospitals where health care providers are mostly racial minorities so that they can care for minority patients in a more comfortable atmosphere. These sorts of designated hospitals can provide culturally sensitive care by eliminating cultural and linguistic barriers. For instance, local hospitals are now getting more involved in transportation linkage programs for low income, mostly racial minority groups. Professional interpreter services are also mostly provided in hospital settings.

We find that, among *all* Medicare beneficiaries including Caucasians, dual eligibility does not have significant impact on physician visits in both office-based and hospital outpatient settings. Among racial minorities, however, the regression results indicated that there was significantly positive impact of dual eligibility on physician visits. Afro-Americans significantly increased physician visits in both clinic and hospital settings. Hispanic visits to outpatient-based physicians increased dramatically after they became eligible to both Medicare and Medicaid. The impact of dual eligibility on office-based physician visits by Asians was positive but was not

statistically significant. An unexpected consequence is that outpatient physician visits fell sharply due to dual eligibility among Asian Americans.

In summary, we find that Afro-Americans significantly increased physician visits in both clinic and hospital settings. Hispanic visits to outpatient-based physicians increased dramatically after they became eligible to both Medicare and Medicaid.

[Table Five Placed Here]

Impact on home health days

Except for Asian Americans, the racial minority groups of Medicare beneficiaries showed a tendency to use more home health services. The probability of having chronic diseases gets higher and the number of co-morbidities tends to increase among Medicare beneficiaries. As the chronic medical conditions require more frequent and persistent medical care, racial minority members tend to use more days of home health provider services.

Being dually eligible positively influences the agency-related home health provider days at 1% significance level. We find that, among *all* Medicare beneficiaries including Caucasians, dual eligibility has significant and positive impact on the utilization of home health services. This can be accounted for by the differences in the extent to which they suffer from “bad health”. As reported in Table 4, associated with “bad health”, dual eligibles are more likely to have chronic conditions(s) and a large number of co-morbidities than Medicare only beneficiaries.

The strong positive impact of dual eligibility on the utilization of home health care among *all* Medicare beneficiaries may be contributed to by the coverage difference between Medicare only and dual eligibles. Medicaid pays almost all financial burdens from home

healthcare services. Medicare-only-coverage, however, does not, forcing the beneficiaries to pay from their own out-of-pocket resources for agency-related home health services. Regarding this finding, two possible interpretations comes in: either *overutilization* among dual eligibles due to generous coverage of home health benefits from Medicaid or *underutilization* among MOBs due to insufficient coverage from Medicare which does not contain home health benefits. Without knowing appropriate and feasible level of home health care use, it is hard to determine which interpretation is suitable for preparing the basis toward reforming the public health insurance system.

The interacted effect of being dually eligible and being Asian is statistically significant on the receipt of home health provider services. Compared with Asian Americans with Medicare coverage only, those with additional health insurance coverage from Medicaid became more likely to utilize home health services. Among Asian American Medicare beneficiaries as a whole, the demand for and thus utilization of home health services were not very strong compared with other racial minorities, i.e., Afro-Americans and Hispanics. With Medicaid coverage supplemental to Medicare, containing home health benefits, the likelihood of using home health care was substantially increased. This result indicates that demand for and thus utilization of home health care is much more intensely affected by dual eligibility compared with other racial groups including Afro-Americans, Hispanics, and Caucasians. The induced demand for and thus utilization of home health services were the most sizable among Asian American Medicare beneficiaries. Considering that dual eligibility for Afro-Americans actually reduced their utilization of home health services, we find that in the home health setting, Asian Americans' induced demand and thus utilization were quite responsive to the expanded benefit package of the public health insurance system.

Impact on dental visits

Dental visits were positively associated with school years and socioeconomic status. Individuals with low level of education (“less than high school”) tended to use less dental care. Those in poverty were significantly likely to make less dental visits. Except for Hispanics, whose effects were not significant, Afro-American and Asian-American Medicare beneficiaries were found likely to make less dental visits. Lower level of socioeconomic status may be responsible for less utilization of dental care. Since traditional Medicare does not contain dental coverage, MOBs are supposed to pay for the receipt of dental service from their own out-of-pocket resources.

Dual eligibility had significantly negative influence on the dental service use. As a whole group, Medicare beneficiaries were not active in using dental services in response to the addition of dual eligibility though in many states Medicaid carried dental coverage. Among racial minorities, however, the regression results indicate that there was significantly negative impact of dual eligibility on dental care visits. Being Afro-American dually eligibles significantly increased dental visits. Asian Americans made more dental visits due to the additional coverage from Medicaid. The impact of dual eligibility on dental visits by Hispanics was positive but was not statistically significant. Interacted with dual eligibility, being Afro-American and Asian American significantly increased dental visits. Our general conclusion is that newly added dental coverage by Medicaid raised the utilization of dental services by racial minority members.

Discussion

In the case of office-based physician visits, the positive significant effect of “Afro-American dual eligibility” may call for careful attention in order to reconcile with the seemingly

contradictory finding of the adverse significant effect of being “Afro-American.” These findings suggest that dual eligible Afro-Americans are heterogeneous from Medicare only Afro-Americans in their utilization behaviors. The proportion of the non-elderly disabled among Afro-American dual eligibles (34.7%, Table 3) is much higher than that among Medicare only beneficiaries (16%, Table 3). Since non-elderly dual eligibles are less likely to be wealthy and more likely to be heavily disabled compared with non-elderly Medicare only beneficiaries, the non-elderly dual eligibles’ medical care needs are expected to be more desperate. Then, among Afro-American dual eligibles with relatively serious disabilities, indispensable medical care needs may be more important in their utilization decision than their psychological hesitation due to the attitudinal discomfort with health care professionals. On the contrary, among Afro-Americans, the health care disparity issue may yield to the reluctance in using office-based physician services.

Other service utilizations such as inpatient nights and emergency visits did not characterize statistically significant impacts from race-dual eligibility interactions. To be accepted for inpatient care physician’s referral is needed. If the referrals are made under the physician’s negative attitude towards Afro-American dual eligibles, unlike office-based physician visits, outpatient or home health care use, the utilization of inpatient nights among Afro-American dual eligibles may be limited by physicians’ discretion, which implies the presence of health care disparity against Afro-Americans in terms of physicians’ referral.¹³ For the emergency services, health care disparity arguments seem not to work because the utilization pattern of emergency care depends on the immediate needs of patients rather than discretionary decisions by health care professionals.

This study supports the hypotheses that Medicaid-Medicare dual eligibility induces more health care use among Medicare beneficiaries in the home health care setting. However, in other settings of health care, dual eligibility did not have increased the utilization of services by Medicare beneficiaries as a whole. Among racial minority groups of Medicare beneficiaries, the impact of dual eligibility was significant and noticeable. This result is explained by racial minority members' strong medical care needs due to multiple chronic conditions, more limitations(s) to activities of daily living (ADL) / instrumental activities of daily living, and severe disabilities such as AIDS for non-elderly Afro-American males and diabetes for non-elderly Afro-American females.^{14, 15, 16} Furthermore, AIDS and diabetes are positively correlated with low-income level which satisfies the eligibility condition for Medicaid.^{17, 18} The weak result for the effect of being "Afro-American" on office-based physician visits and dental visits may be induced by invisible prejudices against them by health care professionals who are overwhelmingly "whites."

In order to have cost-effective publicly-funded health care delivery systems designed to deal with increased health care demand among racially minor dual eligibles, a precise assessment of their medical service needs is necessary. Based on properly collected information about minority health care needs we may be able to provide optimally coordinated health care services between the two major public insurance systems, Medicare and Medicaid. A successful example of the integrated care programs designed to serve the Medicaid-Medicare dual eligibles (MMDE) at lower cost has been established in the Program of All-Inclusive Care for the Elderly (PACE), Evercare, Social Health Maintenance Organizations, and state/federal initiatives such as the Wisconsin Partnership Program, Texas STAR+PLUS.¹⁹

For further studies, it is recommended to explicitly investigate the role of co-morbidities in the utilization of various health care services. Both the numbers of and combination of different kinds of co-morbidities are important in explaining the demand for health care among dual eligibles. Patients with diabetes are less likely to be responsive to physicians' instructions if they suffer from depression at the same time.^{20, 21} If dual eligibles have such a combination of co-morbidities or have more complexity in their diseases, they are expected to make unnecessary or excessive visits because of their idle compliance to physician's instructions. To better understand the utilization differences between MMDEs and MOBs, further research efforts to examine disease-specific patterns of health care use are suggested.

TABLES

Table 1. Independent Variable Definitions

Variables	Definition
OBDRV	Office-based physician visits
OPDRV	Outpatient physician visits
HHAGD	Agency home health provider days
DVTOT	Dental visits

Source: Medical Panel Survey Expenditure, 1996-2000, full-year (HC-12, HC-6, HC-26, HC-38, HC-50) files.

Table 2. Descriptive Statistics of Independent and Dependent Variables

Variables	Mean	Std.Dev.	Min	Max
<u>Demographics</u>				
Age	69.3	15.4	0	90
Male	0.41	0.49	0	1
Married	0.41	0.49	0	1
Less than high school graduation	0.53	0.50	0	1
Rural	0.27	0.45	0	1
<u>Region</u>				
Northeast	0.19	0.40	0	1
Midwest	0.19	0.39	0	1
West	0.22	0.41	0	1
South	0.39	0.42	0	1
<u>Medical Condition</u>				
Poor health	0.36	0.48	0	1
Chronic disease	0.48	0.50	0	1
Number of co-morbidities	5.67	4.19	0	38
<u>Socioeconomic Status</u>				
Poverty	0.25	0.43	0	1
Still work	0.11	0.31	0	1
<u>Race/Ethnicity</u>				
Asian	0.02	0.15	0	1
Hispanic	0.17	0.37	0	1
African-American	0.18	0.39	0	1
<u>Medicare Only/Dual Eligibility</u>				
Medicare only beneficiary (MOB)	0.77	0.42	0	1
Medicaid-Medicare dual eligible (MMDE)	0.23	0.42	0	1
<u>Independent Variables</u>				
Office-based physician visits (OBDRV)	6.42	8.26	0	165
Outpatient physician visits (OPDRV)	0.49	3.96	0	234
Agency home health provider days (HHAGD)	11.9	51.4	0	632
Total dental visits (DVTOT)	0.78	1.98	0	80
N = 8,262				

Source: Medical Panel Survey Expenditure, 1996-2000, medical condition (HC-6R, HC-18, HC-27, HC-37, HC-52), and full-year (HC-12, HC-16, HC-26, HC-38, HC-50) files. Sample includes Medicare beneficiaries who do not have private health plans.

Table 3. Socioeconomic and Health-Related Characteristics of Medicaid-Medicare Dual Eligibles (MMDE) and Medicare only beneficiaries (MOB)

Variables	MOB	MMDE		
		Asian	Black	Hispanic
<u>Demographic characteristics</u>				
Age	70.9	71.1	63.5	67.1
Percentage elderly (age 65 and over)	84.0%	88.0%	65.3%	77.0%
Percentage male	43.1%	38.0%	30.7%	32.6%
Percentage married	46.5%	43.5%	14.9%	30.8%
Percentage college and above	12.6%	12.0%	3.16%	1.75%
High school graduation	40.0%	12.0%	23.2%	11.9%
less than HS graduation	47.4%	76.1%	73.7%	86.4%
<u>Region</u>				
Northeast	20.9%	6.5%	10.9%	15.2%
Midwest	20.8%	2.2%	17.5%	2.9%
West	20.8%	79.3%	11.2%	41.5%
South	37.5%	12.0%	60.4%	40.4%
Percentage rural	26.4%	4.35%	28.0%	18.1%
<u>Medical condition</u>				
Percentage chronic disease	46.8%	41.3%	56.4%	52.8%
Number of co-morbidities	5.44	4.15	5.80	6.40
Percentage limitation(s) to IADL	28.5%	33.7%	45.6%	39.0%
Percentage limitation(s) to ADL	22.6%	23.9%	33.5%	32.7%
<u>Personal income level</u>				
Equal to 0 or less	6.21%	17.4%	10.7%	9.75%
Below \$8,319	32.2%	45.7%	59.8%	57.9%
\$8,320-\$17,999	34.3%	31.5%	23.6%	27.9%
\$18,000-\$32,604.2	17.2%	5.43%	5.05%	4.48%
\$32,604.3 or more	10.2%	0%	0.8%	0%
Mean total personal income(\$)	15,298.7	7,821.6	7,355.4	7,281.7
<u>Poverty level</u>				
Below 100%	18.9%	32.6%	52.6%	38.0%
100-124%	8.6%	3.3%	14.5%	14.6%
125-199%	21.5%	26.1%	17.3%	22.4%
200-399%	28.4%	20.7%	12.4%	21.1%
400% or more	22.6%	17.4%	3.2%	3.9%

Source: Medical Panel Survey Expenditure, 1996-2000, and full-year (HC-12, HC-16, HC-26, HC-38, HC-50) files. Note: Poverty variables are constructed by dividing family income by the applicable poverty line (based on family size and composition), with the resulting percentages grouped into 5 categories: negative or poor (less than 100%), near poor (100% to less than 125%), low income (125% to less than 200%), middle income (200% to less than 400%), and high income (greater than or equal to 400%).

Table 4. Logistic Regression Results on Insurance Coverage for Seniors, 1996-2000

	MMDE		MOB	
	Odds Ratio	Std. Dev.	Odds Ratio	Std. Dev.
<u>Demographics</u>				
Age	0.976***	0.002	1.025***	0.002
Male	0.747***	0.063	1.338***	0.113
Married	0.382***	0.033	2.617***	0.223
Less Than High School	2.082***	0.165	0.480***	0.038
Rural	1.253**	0.111	0.798**	0.070
<u>Region</u>				
Northeast	0.700***	0.081	1.428***	0.166
Midwest	0.718***	0.079	1.393***	0.153
West	1.154	0.116	0.867	0.087
<u>Medical Condition</u>				
Poor Health	1.421***	0.100	0.704***	0.050
Number of Co-morbidities	1.062***	0.009	0.941***	0.008
Chronic Disease	1.131	0.076	0.884	0.059
<u>Socioeconomic Status</u>				
Poverty	2.215***	0.158	0.451***	0.030
Still Work	0.474***	0.075	2.110***	0.333
<u>Race/Ethnicity</u>				
Asian	5.426***	1.219	0.184***	0.041
Hispanic	2.570***	0.258	0.389***	0.039
Afro-American	1.794***	0.177	0.555***	0.055
<hr/>				
N	8260		8260	
Wald Chi2 (16)	934.83		934.83	
Prob>Chi2 (16)	0.000		0.000	
Pseudo R ²	0.194		0.194	

Source: Medical Panel Survey Expenditure, 1996-2000, medical condition (HC-6R, HC-18, HC-27, HC-37, HC-52), and full-year (HC-12, HC-16, HC-26, HC-38, HC-50) files. Note: Bivariate logistic regression performed. Robust standard errors reported. * indicates being significant at 0.10 level, two tailed test; ** indicates being significant at 0.05 level; *** indicates being significant at 0.01 level. Dependent variables are: Medicaid-Medicare dual eligibility (MMDE) and Medicare coverage only (MOB). Sample includes Medicare beneficiaries who do not have private health plans.

Table 5. Impact of Dual Eligibility on Health Care Utilization in Medicare, 1996-2000

	Office-Based Physician Visits	Outpatient Physician Visits	Home Health Provider Days	Total Dental Care Visits
<u>Demographics</u>				
Age	0.997 (0.001)***	0.995 (0.003)	1.003 (0.004)	0.990 (0.002)***
Male	0.992 (0.022)	1.475 (0.127)***	1.092 (0.107)	0.855 (0.044)***
Married	1.062 (0.023)**	1.007 (0.086)	0.614 (0.068)***	1.152 (0.061)**
Less Than High School	0.878 (0.019)***	0.718 (0.063)***	0.977 (0.097)	0.505 (0.027)***
Rural	0.970 (0.023)	0.887 (0.083)	1.468 (0.140)***	0.762 (0.044)***
<u>Region</u>				
Northeast	1.083 (0.031)***	1.310 (0.143)**	1.266 (0.158)	1.377 (0.092)***
Midwest	0.958 (0.027)	1.433 (0.166)***	0.794 (0.095)	1.200 (0.080)**
West	0.901 (0.025)***	0.715 (0.082)***	0.775 (0.099)*	1.246 (0.082)***
<u>Medical Condition</u>				
Poor Health	1.163 (0.025)***	1.150 (0.101)	1.435 (0.129)***	0.735 (0.041)***
# of Co-morbidities	1.136 (0.003)***	1.104 (0.013)***	1.037 (0.010)***	1.091 (0.008)***
Chronic Disease	1.133 (0.023)***	1.414 (0.117)***	0.832 (0.071)*	0.893 (0.043)**
<u>Socioeconomic Status</u>				
Poverty	1.004 (0.025)	1.007 (0.099)	1.031 (0.096)	0.775 (0.050)***
Still Work	0.907 (0.031)***	0.666 (0.090)***	1.370 (0.347)	1.080 (0.079)
<u>Race/Ethnicity & Dual Eligibility</u>				
Asian	0.893 (0.085)	5.685 (2.040)***	0.023 (0.015)***	0.513 (0.111)***
Hispanic	0.994 (0.035)	0.906 (0.132)	1.722 (0.305)***	1.000 (0.086)
Afro-American	0.934 (0.031)*	1.453 (0.184)***	2.240 (0.359)***	0.646 (0.056)***
Dual Eligibility	1.037 (0.037)	0.779 (0.115)	2.093 (0.259)***	0.618 (0.060)***
Dual*Asian	1.109 (0.0157)	0.096 (0.056)***	30.40 (25.29)***	2.009 (0.682)*
Dual*Hispanic	1.105 (0.066)	2.220 (0.541)***	0.955 (0.224)	1.274 (0.200)
Dual*Afro-American	1.175 (0.071)**	2.645 (0.627)***	0.631 (0.134)*	1.927 (0.314)***
LR Chi2 (20)	2,691.53	247.07	214.76	663.48
Prob> Chi2 (20)	0.000	0.000	0.000	0.000
Number of obs.	8,260	8,260	8,185	8,260
Nonzero obs.	7,094	1,294	942	2,395
Zero obs.	1,160	6,966	7,243	5,865

Source: Medical Panel Survey Expenditure, 1996-2000, full-year (HC-12, HC-16, HC-26, HC-38, HC-50) files.

Note: Zero-Inflated Negative Binomial (ZINB) regressions performed. Robust standard errors reported in parenthesis. *, **, and *** denote 10%, 5%, and 1% significance of two tailed test, respectively.

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