

UCLA

UCLA Previously Published Works

Title

Variations in Cataract Extraction Rates in Medicare Prepaid and Fee-for-Service Settings

Permalink

<https://escholarship.org/uc/item/7dw171h8>

Journal

JAMA, 277(22)

ISSN

0098-7484

Authors

Goldzweig, CL
Mittman, BS
Carter, GM
[et al.](#)

Publication Date

1997-06-11

DOI

10.1001/jama.1997.03540460029028

Peer reviewed

Variations in Cataract Extraction Rates in Medicare Prepaid and Fee-for-Service Settings

Caroline Lubick Goldzweig, MD, MSPH; Brian S. Mittman, PhD; Grace M. Carter, PhD; Tenzing Donyo, MBA; Robert H. Brook, MD, ScD; Paul Lee, MD, JD; Carol M. Mangione, MD, MSPH

Objective.—To compare rates of cataract extraction in 2 prepaid health settings and in traditional fee-for-service (FFS) settings.

Design.—A cross-sectional analysis using 1993 health maintenance organization (HMO) Medicare claims and encounter files, the Health Care Financing Administration (HCFA) 5% Medicare Part B provider/supplier file, and the HCFA October 1992 100% Medicare population file.

Setting.—Southern California Medicare FFS settings and the staff-model and independent practice association (IPA) plans of a large California HMO.

Patients.—1993 Medicare beneficiaries aged 65 years and older. The study included 43 387 staff-model HMO enrollees, 19 050 IPA enrollees, and 47 150 FFS beneficiaries (a 5% sample of all Southern California FFS beneficiaries).

Main Outcome Measure.—Age and risk-factor adjusted rates of cataract extraction per 1000 beneficiary-years.

Results.—After controlling for age, sex, and diabetes mellitus status, FFS beneficiaries were twice as likely to undergo cataract extraction as were prepaid beneficiaries ($P < .01$). Female FFS beneficiaries were nearly twice as likely to undergo the procedure as were male FFS beneficiaries ($P < .001$); there were no extraction rate differences by sex in the prepaid settings.

Conclusion.—Because of the potential implications for vision care in the elderly, the significantly different rates of cataract extraction in FFS and prepaid settings warrant further clinical investigation to determine whether there is overuse in FFS vs underuse in prepaid settings. Such investigations must assess the appropriateness of cataract surgery by evaluating its use relative to clinical need.

JAMA. 1997;277:1765-1768

IN THE PAST 10 years, managed care organizations have captured an increasing share of the Medicare market, particularly in the western United States. In 1993, three fourths of the 700 000 Medicare beneficiaries who were enrolled in health maintenance organiza-

tions (HMOs) lived in California.¹ As the federal government grapples with uncertainty regarding the financial solvency of the Medicare program, policy changes may support further increases in Medicare HMO enrollment.²

Despite this movement to managed care, little is known about how use of elective surgery might vary for the elderly who are enrolled in prepaid vs traditional fee-for-service (FFS) Medicare plans. For the general population, use of surgeries such as cholecystectomy, appendectomy, hysterectomy, and tonsillectomy^{3,4} is lower in prepaid plans. Recent studies have also found lower rates of cesarean section and procedures for the treatment of coronary artery disease in prepaid settings.⁵⁻⁸

Cataract extraction is one of the most common surgical procedures performed in the Medicare population, and it is

known to be highly effective.⁹⁻¹³ It accounts for Medicare's single largest expenditure and costs the Health Care Financing Administration (HCFA) about \$3.4 billion per year.¹⁴ The discretionary nature of cataract surgery makes its use susceptible to financial and organizational incentives.

For editorial comment see p 1807.

One would expect rates of cataract extraction to be lower in prepaid settings and higher in FFS settings. Prepaid delivery systems use utilization review and prior approval to assess the appropriateness of referrals to specialists, which is likely to result in lower use of services. In traditional FFS settings, there is no utilization review and there are financial incentives to do more surgery.¹⁵ In prepaid settings, however, there can be financial rewards for providing less care.¹⁶ We studied whether there are variations in rates of performing cataract extraction in 3 health care models: the staff-model HMO, the independent practice association (IPA), and traditional FFS.

METHODS

Study Population

Our study population consisted of 1993 Medicare beneficiaries aged 65 years and older living in Southern California who self-selected into prepaid or traditional FFS settings. For the prepaid setting, we studied Medicare enrollees of a large western US HMO that has both staff-model and network-model providers in Southern California. We studied all Medicare enrollees in the staff-model plans, where providers were salaried. We also studied all enrollees in the HMO-affiliated IPAs; in these plans, the primary care group was capitated and at risk for specialty services and the ophthalmologists were reimbursed on a discounted FFS basis. Our FFS compari-

From the Division of General Internal Medicine, Veterans Affairs Medical Center, West Los Angeles, Calif (Dr Goldzweig); Department of Medicine, University of California Los Angeles School of Medicine (Drs Goldzweig, Brook, and Mangione); RAND, Santa Monica, Calif (Drs Goldzweig, Mittman, Carter, Brook, Lee, and Mangione and Mr Donyo); and the Department of Ophthalmology, University of Southern California School of Medicine, Los Angeles (Dr Lee).

This project was funded by the health maintenance organization that was the subject of the study. This health maintenance organization was not involved in data analysis or the interpretation of results.

Reprints: Caroline Lubick Goldzweig, MD, MSPH, Division of General Internal Medicine, West Los Angeles Veterans Affairs Medical Center, 11301 Wilshire Blvd, 111G, Los Angeles, CA 90073 (e-mail: GOLDZWEIG.CAROLINE_L@WEST-LA.VA.GOV).

son population consisted of a 5% sample of Southern California Medicare beneficiaries who used traditional, nonprepaid providers and who resided in ZIP code regions covered by the HMO plans. We considered the entire 1993 population of Medicare enrollees in each setting to be eligible for cataract extraction.

We were most interested in examining rates of surgery for cataracts that were presumably causing functional impairment. We excluded persons with glaucoma who may have had surgery for other indications. Three of the IPAs, accounting for 44% of the total IPA population, changed their methods of provider reimbursement in September 1993 and became fully capitated for specialty services. Because this change could influence the use of specialty services, we excluded members of these IPAs from the study from the time of the reimbursement change to the end of 1993.

Data Sources

We used 3 data files: (1) staff-model HMO encounter files, which include *International Classification of Diseases, Ninth Revision, Clinical Modification*¹⁷ (ICD-9-CM) diagnoses; (2) IPA claims files, which include *Current Procedural Terminology*¹⁸ (CPT-4) and ICD-9-CM diagnoses; (3) HCFA 1993 5% Part B provider/supplier file, which includes Medicare outpatient CPT-4 and ICD-9-CM claims for a random 5% of FFS beneficiaries. We used these 3 files to identify cataract extraction procedures and persons with diabetes mellitus or glaucoma. We used the following ICD-9-CM and CPT-4 codes to identify cataract extractions: 66940, 66850, 66852, 66920, 66930, 66940, 66983, 66984, 13.19, 13.41, 13.42, 13.43, 13.51, and 13.59.

We used 2 files for demographic information and to determine denominators for our rates of cataract extraction: a 1993 staff-model and IPA Medicare member file, which identifies all eligible HMO members and contains dates of enrollment and disenrollment from the HMO; and the October 1992 HCFA 100% Medicare population file, which identifies the Medicare FFS population.

Because there were month-to-month changes in beneficiary enrollment status in the HMO, we weighted our denominator to reflect the duration of active enrollment for each individual beneficiary and expressed it in beneficiary-years. We obtained cataract extraction rates by dividing the total number of surgical procedures by the total number of beneficiary-years in a given setting. Seventy-two percent of staff-model HMO beneficiaries were enrolled for all of 1993, and 49% of IPA members were enrolled for at least 9 months.

Data Linkage

To determine rates of cataract extraction in the different settings, we used staff-model and IPA beneficiaries identified from the HMO member file as the denominator for the staff-model encounter file and the IPA claims file, respectively. The HCFA 1992 population file provided the denominator for the 5% provider/supplier file. The various HMO data files were linked according to the HMO members' unique identification numbers and resulted in a match rate of between 90% and 97%. Because our FFS provider/supplier file represented a 5% sample of FFS beneficiaries, we used 5% of the count of beneficiaries identified in each age and sex stratum in the FFS Medicare population file.

If a person had more than 1 cataract extraction in 1993, each extraction was counted. While we were able to link a procedure to an individual, we could not link a procedure to a specific eye. To eliminate any duplicate entries for the same procedure, we used only paid claims identified in the IPA and provider/supplier claims files. For the staff-model encounter file, we eliminated duplicate encounters when the dates of the procedure fell within a 1-week period. A total of 6% of staff-model, 9% of IPA, and 20% of FFS beneficiaries who underwent at least 1 cataract extraction in 1993 had a second extraction within our study period.

Because our population file consisted of counts of beneficiaries by age, sex, and ZIP code, we were unable to link the provider/supplier and population files at the individual level. To perform our analysis, we assumed that the number of persons in the FFS setting in these ZIP codes and these age and sex distributions remained constant during the 15-month period from October 1992 through December 1993. We constructed 12 cells representing every combination of age (categorized as 65-74 years, 75-84 years, ≥ 85 years), sex, and diabetes status. The provider/supplier claims file provided a count of cataract extractions for each cell. This file also provided counts of the total number of persons treated for diabetes mellitus, their age, and their sex. We used these age-specific and sex-specific counts to estimate how many of the total number of beneficiaries in the population file had diabetes.

Statistical Analysis

We performed 3 principal analyses to determine whether rates of cataract extraction were significantly different among the 3 settings. First, we performed pairwise comparisons using Student *t* tests to evaluate the significance of rate differences by setting. Second, we used maximum likelihood estimates to fit a mul-

tivariate logistic regression to the data for each setting to determine how rates varied with population characteristics. Epidemiologic studies have demonstrated that increasing age, female sex, and presence of diabetes mellitus increase the prevalence of cataract and, therefore, should influence rates of cataract surgery.^{19,20} Because the duration of enrollment affects the probability of having cataract surgery, the models for the prepaid plans included this variable as well.

Using the likelihood ratio test, we systematically paired the 3 individual regressions. The χ^2 value for the comparisons was significant at the $P < .001$ level, indicating that the data could not reliably be pooled. Therefore, in our third analysis, we predicted average rates of cataract extraction in each setting for each age, sex, and diabetes status category and compared the prepaid rates with the FFS rate. Statistical significance ($P < .05$) was assessed using *t* tests based on the predicted extraction rates and corresponding standard errors.

Because of the discrepancy among settings in the number of beneficiaries who underwent 2 cataract extractions, we performed sensitivity analyses to determine whether the greater number of second cataract extractions in the FFS setting could explain differences in rates between the prepaid and FFS settings. When only the first cataract surgery per beneficiary was included in the logistic regressions, the magnitude of differences in rates among settings was slightly lower. However, all tests of statistical significance remained unchanged.

Validation

We did not validate the IPA claims because they were linked to reimbursement, which is generally believed to increase data accuracy.²¹ To validate the staff-model encounter file, we compared a convenience sample from our data set with staff-model HMO ophthalmologic logbooks and found a 99% correspondence. Previous investigations have demonstrated 99% accuracy for claims for cataract extraction in the HCFA Part B provider/supplier claims file.²² We assumed a similar level of accuracy.

RESULTS

In 1993, there were 43 387 staff-model HMO and 19 050 IPA beneficiaries in Southern California. In our 5% sample, there were 47 150 Southern California FFS Medicare beneficiaries. In general, the age and sex distributions were similar, although because of the large sample sizes, differences were statistically significant (Table 1). Of note, the staff-model HMO population was somewhat older and there was a smaller proportion of persons with diabetes mellitus in the IPA setting.

Table 1.—Population Characteristics by Plan Type

Characteristic	Plan Population, %		
	Staff Model (n=43 387)	IPA* (n=19 050)	FFS* (n=47 150)
Age, y			
65-74	54†	60	59
75-84	35†	31	30
≥85	11	9†	11
Female	58	57	58
Diabetes	12†	5†	13†

*IPA indicates independent practice association; and FFS, fee-for-service setting.
†All differences significant at $P < .001$.

Unadjusted rates of cataract extraction per 1000 beneficiary-years varied significantly when comparing prepaid settings with the FFS setting, but not when comparing the 2 prepaid settings. FFS rates were more than twice as high as staff-model rates (FFS, 35 extractions/1000 beneficiary-years; staff model, 17 extractions/1000 beneficiary-years; IPA, 22 extractions/1000 beneficiary-years; FFS vs staff and FFS vs IPA, $P < .001$). There were similarities but also important differences in which factors were associated with cataract extraction in each setting (Table 2). In all settings, the probability of having a cataract extraction was significantly greater for beneficiaries aged 75 to 84 years compared with those aged 65 to 74 years, for persons with diabetes mellitus, and for prepaid beneficiaries enrolled for longer periods of time. In contradistinction to the prepaid settings where sex was not a risk factor for cataract extraction, female FFS beneficiaries were twice as likely to undergo cataract extraction as their male counterparts. Additionally, the oldest FFS beneficiaries (aged ≥85 years) were more likely to have cataract extractions than the youngest group (aged 65-74 years). We tested interaction terms (female×diabetes and diabetes×age ≥85 years) that, while statistically significant in the FFS setting, did not alter the significance of the odds ratios for other predictors in any setting.

The large differences in unadjusted rates of cataract extraction by plan persisted even after adjusting for age, sex, and diabetes status (Table 3). Predicted average adjusted rates of cataract extraction per 1000 beneficiary-years, across all age, sex, and diabetes strata, were significantly higher in the FFS setting than the prepaid settings, with greater than 2-fold differences in many instances. For example, when controlling for sex and diabetes status, beneficiaries aged 75 to 84 years had rates of cataract extraction of 23 per 1000 beneficiary-years in the staff-model setting, 25 per 1000 beneficiary-years in the IPA setting, and 57 per 1000 beneficiary-years in the FFS setting ($P < .001$ for prepaid vs FFS settings). Controlling for age and diabetes status, rates

Table 2.—Predicting Cataract Surgery in 3 Delivery Settings

Variable	Staff Model, OR (95% CI)* (n=43 424)	IPA, OR (95% CI) (n=19 018)	FFS, OR (95% CI) (n=47 425)
Age 75-84 y†	1.7 (1.4-2.0)‡	1.7 (1.3-2.2)‡	2.6 (2.3-2.9)‡
Age ≥85 y†	1.2 (0.9-1.7)	1.2 (0.7-2.0)	2.6 (2.2-3.0)‡
Female	0.8 (0.7-1.0)	1.1 (0.9-1.5)	2.0 (1.7-2.2)‡
Diabetes	1.5 (1.1-2.1)§	2.3 (1.3-4.1)§	2.6 (2.1-3.2)‡
Female×diabetes	1.4 (1.0-2.1)	0.9 (0.4-2.0)	0.6 (0.5-0.8)‡
Diabetes×age ≥85 y	1.0 (0.5-2.2)	¶	0.4 (0.3-0.7)‡
Month#	1.7 (1.2-2.4)§	2.0 (1.6-2.6)‡	**
Month#	0.98 (0.96-0.998)††	0.97 (0.95-0.98)‡	**
ROC curve	0.66	0.69	0.67

*OR indicates odds ratio; CI, confidence interval; IPA, independent practice association; FFS, fee-for-service; and ROC, receiver operating characteristic.

†As compared with age 65 to 74 years.

‡ $P < .001$ (within model).

§ $P < .01$ (within model).

||These are interaction terms.

¶This variable is not included in the model because none of the 53 persons had a cataract extraction.

#Variable "month" indicates total months of enrollment; "month#" indicates a nonlinear (second power) relationship between a cataract extraction and length of enrollment.

**These variables are not included in the model because all FFS beneficiaries are assumed to be enrolled for 12 months.

†† $P < .05$.

of extraction for women were 16 per 1000 beneficiary-years in the staff-model setting, 19 per 1000 beneficiary-years in the IPA, and 43 per 1000 beneficiary-years in the traditional FFS setting ($P < .001$ for prepaid vs FFS). And, controlling for age and sex, rates for those with diabetes were 28 per 1000 beneficiary-years in the staff model, 37 per 1000 in the IPA, and 57 per 1000 in the FFS setting ($P < .001$ staff model vs FFS; $P < .01$ for IPA vs FFS). Average adjusted rates of cataract extraction were significantly different and nearly twice as high for women as for men in the FFS setting (Table 4). Rates were essentially identical for men and women in the staff and IPA settings.

COMMENT

Our analysis of cataract extraction in 3 different Medicare settings demonstrates that, after controlling for differences in risk factors that affect the prevalence of cataracts, such as age, sex, and diabetes, beneficiaries in the traditional FFS system had much higher rates of surgery than did those enrolled in staff-model HMO or IPA settings. A number of plan-specific characteristics could explain these differences. Both prepaid settings restricted referrals to ophthalmologists using gatekeepers and utilization management. Primary care physicians in the staff-model setting were salaried and therefore not directly at financial risk, although there may have been incentives to encourage fewer referrals. The capitated primary care physicians in the IPAs were at financial risk for most specialty services. On the other hand, FFS patients could self-refer to ophthalmologists who had financial incentives to perform more surgery. Given the discretionary nature of cataract surgery, it is possible that prepaid settings delayed

rather than denied cataract extractions. A longitudinal study design is needed to determine whether there would be evidence of cataract surgery catch-up occurring for those surviving to older ages.

It is interesting that there was no difference in rates between the prepaid settings, despite the fact that IPA ophthalmologists had a financial incentive to perform more surgery. Utilization review and gatekeeping may have limited access to these providers.

With the rapid growth of Medicare managed care in California, these differences in rates of cataract extraction could have a substantial impact on vision care for older persons. Because there was no assessment of need for surgery across settings, we cannot determine which rate is appropriate or whether some rates are too low and others too high. For instance, if there was underuse in the prepaid settings, this would have important implications for visual disability in the elderly, which, if uncorrected, can lead to poor quality of life, greater risks for falls, hip fractures, and accidents, and may make cognitive function worse.^{9,23-26} However, if there is overuse in the FFS setting, there is the potential for reducing complications from surgery. The determination of the appropriate rate of cataract extraction for this population requires studies that incorporate standardized assessments of visual disability, such as the Activities of Daily Living Scale.²⁷

Our results also demonstrate that women in the FFS setting had a significantly greater probability of undergoing cataract extraction than men, while there were no differences by sex seen in the prepaid settings. Our FFS results replicate those of previous investigators who used comparable data sources¹⁴ and are also consistent with the estimated 50% greater

Table 3.—Adjusted Predicted Rates of Cataract Extraction by Plan Type

Plan Type*	Extractions per 1000 Beneficiary-Years		
	Age 75-84 y†	Female‡	Diabetes Mellitus§
Staff model	23	16	28
IPA	25	19	37¶
FFS	57	43	57

*IPA indicates independent practice association; and FFS, fee-for-service.
 †Rates adjusted for sex and diabetes mellitus status.
 ‡Rates adjusted for age category and diabetes mellitus status.
 §Rates adjusted for sex and age category.
 ||P<.001 when compared with FFS settings.
 ¶P<.01 when compared with FFS settings.

risk of cataract development in women than in men.²⁰ Therefore, observed equivalent rates for men and women in the prepaid setting, which are substantially below those for women in the FFS setting, suggest possible underuse for this subgroup. Lower than expected rates for women in the prepaid setting may be due to sex differences in ability to negotiate the managed care setting, in desire for surgery, or in need to perform complex visual tasks, such as driving. In the FFS setting, these potential differences between men and women may be overshadowed by financial incentives that would encourage extractions in anyone with a visually significant cataract.

An important limitation of our study is that we do not know the extent of prior cataract extraction in our populations. If significant numbers of beneficiaries underwent cataract extraction surgery prior to 1993, our predicted rates would un-

References

- Gomez JM. The graying of HMOs. *Los Angeles Times*. February 27, 1994:D3.
- Pear R. Republicans draw plan for slowing Medicare growth. *New York Times*. September 10, 1995: N1.
- LoGerfo JP, Efrid RA, Diehr PK, Richardson WC. Rates of surgical care in prepaid group practices and the independent setting: what are the reasons for the differences? *Med Care*. 1979;27: 1-10.
- Luft HS. How do health-maintenance organizations achieve their 'savings'? *N Engl J Med*. 1978; 298:1336-1343.
- McCloskey L, Petitti DB, Hobel CJ. Variations in the use of cesarean delivery for dystocia. *Med Care*. 1992;30:126-135.
- Tussing AD, Wojtowycz MA. Health maintenance organizations, independent practice associations, and cesarean section rates. *Health Serv Res*. 1994;29:75-93.
- Stafford RS. Cesarean section use and source of payment. *Am J Public Health*. 1990;80:313-315.
- Young GJ, Cohen BB. Inequities in hospital care. *Inquiry*. 1991;28:255-262.
- Brenner MH, Curbow B, Javitt JC, Legro MW, Sommer A. Vision change and quality of life in the elderly. *Arch Ophthalmol*. 1993;111:680-685.
- Applegate WB, Miller ST, Elam JT, Freeman JM, Wood TO, Gettlefinger TC. Impact of cataract surgery with lens implantation on vision and physical function in elderly patients. *JAMA*. 1987;257: 1064-1066.

Table 4.—Adjusted Predicted Rates of Cataract Extraction by Plan Type: Men vs Women*

Plan Type†	Extractions per 1000 Beneficiary-Years	
	Men	Women
Staff model	18	16
IPA	17	19
FFS	23	43‡

*Rates adjusted for age category and diabetes mellitus status.
 †IPA indicates independent practice association; and FFS, fee-for-service.
 ‡P<.001.

derestimate the true rates of cataract extraction because the absolute number of beneficiaries in each plan who are eligible for surgery would be lower.

While Medicare regulations preclude beneficiaries from receiving simultaneous benefits in prepaid and FFS settings, beneficiaries are free to move back and forth. Our data did not allow us to track individual beneficiaries who may have disenrolled from an HMO plan to have surgery in the FFS setting. However, our rates of cataract extraction reflected this movement because they were weighted to account for duration of enrollment. We also could not track prepaid beneficiaries who paid 100% of the costs themselves for a cataract extraction while remaining in the HMO. If these scenarios occurred frequently, they would affect the accuracy of the rates of cataract extraction reported in this study. Whether they would reflect inappropriate care in the prepaid or FFS settings is not ascertainable from our study.

It is important to note that with the exception of age, sex, and diabetes status,

- Mangione CM, Phillips RS, Lawrence MG, Seddon JM, Orav EJ, Goldman L. Improved visual function and attenuation of declines in health-related quality of life after cataract extraction. *Arch Ophthalmol*. 1994;112:1419-1425.
- Javitt JC, Brenner MH, Curbow B, Legro MW, Street DA. Outcomes of cataract surgery. *Arch Ophthalmol*. 1993;111:686-691.
- Steinberg EP, Tielsch JM, Schein OD, et al. National study of cataract surgery outcomes, variation in four-month postoperative outcomes as reflected in multiple outcome measures. *Ophthalmology*. 1994;101:1131-1141.
- Javitt JC, Kendix M, Tielsch JM, et al. Geographic variation in utilization of cataract surgery. *Med Care*. 1995;33:90-105.
- Hillman AL, Pauly MV, Kerstein JJ. How do financial incentives affect physicians' clinical decisions and the financial performance of health maintenance organizations? *N Engl J Med*. 1989;321:86-92.
- Gold MR, Hurley R, Lake T, Ensor T, Berenson R. A national survey of the arrangements managed-care plans make with physicians. *N Engl J Med*. 1995;333:1678-1683.
- International Classification of Diseases, Ninth Revision, Clinical Modification*. Washington, DC: Public Health Service, US Dept of Health and Human Services; 1988.
- American Medical Association. *CPT: Physicians' Current Procedural Terminology*. 4th ed. Chicago, Ill: American Medical Association; 1987.
- Klein BEK, Klein R, Linton KLP. Prevalence

of the most robust predictors of cataract, our analysis did not adjust for other variables that could affect rates of cataract formation. Such variables, however, would require substantial explanatory power to overwhelm the variations we found among settings. Significant health status differences among the 3 populations not fully accounted for in the study might also affect rates of cataract extraction. A recent Medicare evaluation found evidence of selection bias in Medicare HMOs, where the population of enrollees was healthier than the general FFS Medicare population.²⁸ Whether health status differences would minimize or accentuate the rate differences we found is, however, uncertain. Finally, our study results may not be generalizable to other geographic regions or systems of care where financial incentives are different.

In conclusion, variations in rates of cataract extraction in prepaid and FFS settings indicate that organizational and financial aspects of the different settings influence the likelihood of patients undergoing this discretionary procedure. Given the rapid expansion of prepaid care and the political movement to expand Medicare managed care, we urgently need clinical studies to examine the quality implications of these rate differences, which may significantly impact on the elderly's ability to see.

Dr Goldzweig was a recipient of an Institutional National Research Service Award (HRSA ST32PE19001) for primary care research. Dr Mangione was a recipient of a Clinical Investigator Award from the National Institute on Aging (K08 AG000605) and a Robert Wood Johnson Foundation Generalist Faculty Scholars Program Award (029250).

- of age-related lens opacities in a population. *Ophthalmology*. 1983;99:546-552.
- Leske MC, Sperduto RD. The epidemiology of senile cataracts. *Am J Epidemiol*. 1983;118:152-165.
- Steinberg EP, Whittle J, Anderson GF. Impact of claims data research on clinical practice. *Int J Technol Assess Health Care*. 1990;6:282-287.
- Javitt JC, McBean AM, Sastry SS, DiPaolo F. Accuracy of coding in Medicare Part B claims. *Arch Ophthalmol*. 1993;111:605-607.
- Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. *N Engl J Med*. 1988;319:1701-1707.
- Glynn RJ, Seddon JM, Krug JH Jr, Sahagian CR, Chiavelli ME, Campion EW. Falls in elderly patients with glaucoma. *Arch Ophthalmol*. 1991;109:205-210.
- Cummings SR, Nevitt MC, Browner WS, et al, for the Study of Osteoporotic Fractures Research Group. Risk factors for hip fractures in white women. *N Engl J Med*. 1995;332:767-773.
- Uhlmann RF, Larson EB, Koepsell TD, Rees TS, Duckert LG. Visual impairment and cognitive dysfunction in Alzheimer's disease. *J Gen Intern Med*. 1991;6:126-132.
- Mangione CM, Phillips RS, Seddon J, et al. Development of the 'Activities of Daily Living Scale.' *Med Care*. 1992;30:1111-1126.
- Brown RS, Bergeron JW, Clement DG, Hill JW, Retchin SM. *Does Managed Care Work for Medicare? An Evaluation of the Medicare Risk Program for HMOs*. Princeton, NJ: Mathematica Policy Research Inc; 1993.