

The Centers for Medicare & Medicaid Services' Office of Research, Development, and Information (ORDI) strives to make information available to all. Nevertheless, portions of our files including charts, tables, and graphics may be difficult to read using assistive technology. In some cases due to size or complexity, we were not able to make files fully accessible using assistive technology. Persons with disabilities experiencing problems accessing portions of any file should contact ORDI through e-mail at ORDI_508_Compliance@cms.hhs.gov

Report to Congress
on the
Evaluation of the Demonstration of Coverage of Chiropractic Services
Under Medicare

William B. Stason, MD, MSci
Grant Ritter, PhD
Donald S. Shepard, PhD
Jeffrey Prottas, PhD
Christopher Tompkins, PhD
Timothy C. Martin, PhD
Sue Lee, MA

June 16, 2009

Submitted to:

Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244-1850

Project Officer:

Carol Magee, PhD, MPH

Submitted by:

Brandeis University
Schneider Institutes for Health Policy
415 South Street
Waltham, MA 02454-9110

Project Director:

William B. Stason, MD, MSci

Table of Contents

I. Background	1
A. Overview	1
B. Congressional Mandate	1
C. Medicare Coverage for Chiropractic Services under the Demonstration	2
II. Principal Components of the Report	3
A. Implementation of the Demonstration	3
B. Survey of Users of Chiropractic Services	3
C. Effects of Expanded Coverage on the Use and Costs of Chiropractic Services	4
D. Analysis of Budget Neutrality.....	4
III. Main Findings	5
A. Implementation of the Demonstration	5
B. Survey of Chiropractic Users	6
C. Effects of the Demonstration on the Use and Costs of Chiropractic Services.....	8
IV. Summary of Results and Conclusions	19

List of Tables

Table 1: Demonstration-induced Changes in Users of NMS-related Services – All Beneficiaries with NMS Diagnoses *	9
Table 2: Demonstration-induced Changes in NMS-related Visits in Expanded Chiropractic Service Users *	10
Table 3: Demonstration-induced Changes in Medicare Reimbursements for NMS-related Services – Expanded Chiropractic Service Users *	11
Table 4: Total Expenditures for Chiropractic Services in Demonstration and Comparison Regions - Expanded Chiropractic Services Users	12
Table 5: Demonstration Effects for All Beneficiaries with NMS Diagnoses	13
Table 6: Breakdown of Demonstration Effects by Market Area in the All NMS Analysis	14
Table 7: Breakdown of Demonstration Effects by State in the All NMS Analysis	15
Table 8: Demonstration Effects by Type of Service in the Chiropractic User Analysis	16
Table 9: Breakdown of Demonstration Effects by State in the Chiropractic User Analysis	17
Table 10: Summary of Demonstration Effects on Medicare Costs (millions of dollars)	18

I. Background

A. Overview

This Report to Congress (RTC) presents the findings of an independent evaluation of the Centers for Medicare & Medicaid Services' (CMS) "Demonstration of Coverage for Chiropractic Services under Medicare". The demonstration was conducted from April 1, 2005 through March 31, 2007 and examined the effects of expanded coverage for chiropractic services in four regions: the entire states of Maine and New Mexico, 26 counties in northern Illinois plus Scott County in Iowa, and 17 counties in central Virginia. A letter-format Report to Congress, sent in October 2008, summarized implementation of the demonstration, findings from a survey of Medicare beneficiaries who received chiropractic care in the demonstration areas, and the effects of the demonstration on the use and costs of chiropractic services during its first 18 months. This full Report to Congress constitutes the final evaluation of the demonstration and includes analysis of the full 24 months of the demonstration, examines possible cost offsets to expanded coverage of chiropractic services, and assesses budget neutrality from Medicare's perspective.

B. Congressional Mandate

The demonstration was mandated under Section 651 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Pub. L. 108-173) "for the purpose of evaluating the feasibility and advisability of covering chiropractic services under the medicare program (in addition to the coverage provided for services consisting of treatment by means of manual manipulation of the spine to correct a subluxation described in section 1861(r)(5) of the Social Security Act" The statute also provided that the term "chiropractic services" has the meaning given that term by the Secretary for purposes of the demonstration, but shall include, at a minimum: care for neuromusculoskeletal conditions typical among eligible beneficiaries and diagnostic and other services that a chiropractor is legally authorized to perform by the State or jurisdiction in which such treatment is provided. The demonstration was to last for two years and was to be conducted in four regions of the country, including two with rural

areas and two with urban areas; one site of each area type had to be considered a health professional shortage area (HPSA). Furthermore, the statute required the Secretary to ensure that aggregate payments made under the Medicare program did not exceed the amount that would have been paid in the absence of the demonstration. To do this, a strategy had to be developed for recouping any such additional payments. Specific conditions added by CMS were that: (1) any chiropractor who provided services in these geographic areas was to be eligible to participate; (2) any beneficiary enrolled under Medicare Part B was to be eligible to receive services; and (3) the treatment had to be provided for an active condition for which there was a reasonable expectation of recovery or functional improvement, and not for prevention or maintenance, in accordance with CMS's policy for the reimbursement of all chiropractic services.

C. Medicare Coverage for Chiropractic Services under the Demonstration

Medicare has traditionally covered only manual manipulation to correct subluxations of the spine, which chiropractors define as 'malfunctions of the spine'. Under the demonstration, coverage was expanded to include a broad range of NMS diagnoses involving the spine, extremities, or the neurological system and a broad range of services that chiropractors use to diagnose or treat these conditions. These services included manipulations of the extremities (extraspinal manipulations), a variety of physical therapy (PT) modalities such as electrostimulation and ultrasound, evaluation and management (E&M) visits, and diagnostic tests such as blood tests, x-rays, CT scans, and MRIs.

The American Chiropractic Association (ACA) advocated for expanded coverage that would include the full range of treatment and diagnostic services that chiropractors are trained and legally authorized to perform for NMS conditions. It asserted that expanded coverage would reduce out-of-pocket costs to beneficiaries, attract additional patients to chiropractors, and, potentially, could reduce the total costs of care for Medicare beneficiaries by reducing the use of pain medications and other medical and surgical treatments for these conditions.

The main policy questions addressed by the demonstration are:

1. Did expanded coverage increase Medicare expenditures for chiropractic services and, if so, by how much?
2. Were increases in expenditures for chiropractic services offset by reductions in the costs of non-chiropractic ambulatory (Part B) services or institutional care (Part A)?
3. Was expanded coverage for chiropractic services budget neutral for Medicare?

II. Principal Components of the Report

This report addresses:

- Issues that arose during implementation of the demonstration;
- Medicare beneficiaries' views of the care they have received from chiropractors;
- Effects of the demonstration on the use of chiropractic services and related Medicare expenditures; and
- Analysis of the budget neutrality of the demonstration.

A. Implementation of the Demonstration

Implementation was examined through structured interviews with the key players involved in conducting the demonstration - CMS's Division of Health Promotion and Disease Prevention Demonstrations in the Office of Research, Development, and Information (ORDI), the ACA, Medicare Part B carriers, state chiropractic associations, and practicing chiropractors. Data provided to CMS by Medicare carriers permitted examination of chiropractor participation in the demonstration; the volumes of submitted, approved, and denied claims; and associated dollar costs.

B. Survey of Users of Chiropractic Services

A mailed survey was conducted of Medicare beneficiaries who lived in the demonstration areas and were receiving chiropractic services. The survey's objectives were to: (1) identify the types of medical problems being treated, responses to treatment, satisfaction with the care received, and the financial burden of chiropractic care; and (2) compare

results in beneficiaries who were receiving services from chiropractors who were participating in the demonstration with those who were not.¹

C. Effects of Expanded Coverage on the Use and Costs of Chiropractic Services

Medicare claims for the treatment of the NMS diagnoses were analyzed in demonstration and matched comparison counties to determine the effects of the demonstration on:

- the numbers of beneficiaries with NMS diagnoses who received treatment;
- the proportion of these who received chiropractic services;
- the use and costs of chiropractic services; and
- the effects on Medicare expenditures.

The analysis focused on beneficiaries with diagnoses involving the spine, extremities, or neurological system (NMS diagnoses) who received care during the year before or the two years of the demonstration (April 1, 2005 through March 31, 2007). The analysis of ‘users’ and ‘use’ were based on claims submitted; while the analysis of costs was based on paid claims. Difference-in-difference analysis was used to compare patterns of care and expenditures in demonstration and comparison areas.

D. Analysis of Budget Neutrality

The objectives of this analysis were to examine the effects of expanded coverage for chiropractic services on aggregate Medicare payments for the treatment of NMS diagnoses. The focus was on two populations: all beneficiaries with NMS diagnoses and the subgroup who used chiropractic services. The analysis explored potential cost offsets of increases in payments for chiropractic services by including costs of both institutional (e.g. hospitalizations) and non-institutional services (chiefly ambulatory services by chiropractors and other health professionals). The analysis examined overall effects on Medicare payments and effects in each demonstration area, rural and urban areas, and health professional shortage areas (HPSA and non-HPSA).

¹ Some chiropractors characteristically bill Medicare for expanded coverage services even when they are not reimbursed. In this report, these are termed “non-participating” chiropractors. Chiropractors do this for several reasons but especially to obtain Medicare’s denial so they can bill other insurers. “Participating chiropractors” were identified by having been reimbursed for expanded coverage services.

III. Main Findings

A. Implementation of the Demonstration

The demonstration experienced a slow ramp-up and reached a steady state only in its second year. The main reasons were the time required for Medicare Part B carriers to implement the complex billing system under the demonstration and to educate chiropractors about it. Implementation was also slowed by the absence of public announcements about the demonstration to Medicare beneficiaries and chiropractors. Instead, primary reliance was placed on the ACA and state chiropractic associations to notify chiropractors and their patients.

Medicare Part B carriers reported that, overall, about 40 percent of eligible chiropractors participated in the demonstration with the proportions ranging from 28 to 59 percent in different states and at different points in time. The evaluators conducted site visits to the demonstration areas to determine the roles of state chiropractic associations during implementation of the demonstration and to interview practicing chiropractors to determine their reasons for participating or not participating in it. All interviews were guided by structured interview guides.

The chiropractic associations served to inform practicing chiropractors about the demonstration and provided variable levels of educational services about its conduct. Most practicing chiropractors who participated in the demonstration stated that their primary motivations were to reduce the burden of payments on their patients and to advocate for Medicare coverage for the full range of services they are trained and licensed to provide. Use of the ‘incident to’ rule by Medicare was an important deterrent to participation for some chiropractors. This rule requires that physical therapy (PT) services be performed under a physician’s direction by therapists who are certified to perform these services. Because most chiropractors rely upon chiropractic assistants (CAs) who do not have formal PT certification, application of this rule effectively required chiropractors to perform the services themselves, if they were to be reimbursed.

CMS's rationale for using the 'incident to' rule was to satisfy chiropractors' request to be treated like other physicians. CMS modified the rule during the demonstration to allow participating chiropractors to continue to use their CAs to perform PT services and to bill the beneficiary directly for them, provided the beneficiary agreed to this at the outset.

Chiropractors indicated that the main effect of the demonstration was to shift payment for chiropractic services from the patient or from other insurers to Medicare and that it had little or no effects on practice volumes, patterns of services provided, or net practice incomes. Increases in Medicare-paid claims were mainly for PT services, extraspinal manipulation (of the arms and legs), evaluation and management (E&M) services, and spinal x-rays. Important benefits of the demonstration from chiropractors' perspectives were improved continuity and more efficient patient care because they were now authorized to order needed CT scans, MRIs, or complex x-rays directly rather than having to refer patients to medical physicians to obtain these examinations.

B. Survey of Chiropractic Users

Methods: A mailed survey was conducted in 3,464 users of chiropractic services with a response rate of 71 percent. The objectives of the survey were to examine beneficiaries' awareness of the demonstration, their reasons for seeking chiropractic care, the clinical benefits obtained, satisfaction with care, prior care for the same problem(s), insurance coverage for chiropractic services, and out-of-pocket expenses.

Awareness of the Demonstration: Fewer than half of survey respondents were aware of the demonstration, including only slightly more than half of beneficiaries who were receiving expanded services from participating chiropractors. Chiropractors were the most frequent source of information about the demonstration.

Reasons for Seeking Chiropractic Care and Types of Services Received: The most frequent reasons given for seeking care from chiropractors were favorable earlier experiences (59 percent) and insufficient relief of symptoms by prior treatments from other health professionals (39 percent). Clinical problems involved the back in 78

percent, neck in 50 percent, hip in 38 percent, and shoulder in 32 percent. Pain was the most frequent symptom, followed by difficulty walking. Symptoms were severe or very severe and interfered considerably with usual daily activities for two-thirds of respondents. Manipulation was the most frequent treatment received from chiropractors, followed by various types of PT services. Users of standard chiropractic services were more likely to have received chiropractic services prior to the demonstration than expanded service users and were less likely to have received PT services.

Benefits of Treatment and Satisfaction with Care: Sixty percent of respondents indicated that they received “complete” or “a lot” of relief of symptoms from their chiropractic treatments. Satisfaction with care was high, with 87 percent reporting levels of 8 or higher on a 10-point scale and 56 percent indicating a perfect score of 10. Chiropractic care was felt to be easily accessible, and nearly 95 percent of respondents indicated that they had to wait no more than one week for appointments. Similarly high proportions reported that chiropractors listened carefully and spent sufficient time with them.

Prior Treatments for the Same Clinical Problem: The types of prior treatments received from other health professionals differed strikingly from those received from chiropractors, including pain pills in 58 percent, pain injections in 30 percent, both pain pills and injections in 22 percent, and surgery in 12 percent. Reports on the relief of symptoms for the same clinical problem also differed widely, with 60 percent of respondents indicating that they received ‘moderate’ or ‘complete’ relief from chiropractic treatments compared to 11 percent from treatments by other health professionals. This finding needs to be interpreted with caution, however, because patients whose symptoms were not relieved by prior therapy would be more likely to seek chiropractic care. The high reported use of pain medications and surgery in treatments received from other types of health professionals suggests the potential for achieving cost offsets.

Insurance Coverage and Out-of-pocket Costs: More than two-thirds of respondents (69 percent) reported that they had health insurance in addition to Medicare Part B that covered chiropractic services. Zero out-of-pocket costs were reported by 49 percent of expanded chiropractic service users compared to 39 percent of standard service users ($p=0.0002$). Mean out-of-pocket costs per visit were also lower in expanded service users.

Limitations of the Survey: The results of the survey could be biased if beneficiaries who chose not to respond had had unsatisfactory results from their chiropractic care. The high overall response rate achieved (71 percent) mitigates, but does not eliminate, this possibility. Other limitations include relatively high non-response rates to cost-related questions and the necessarily subjective nature of responses to some questions.

C. Effects of the Demonstration on the Use and Costs of Chiropractic Services

Overview and Methods: Medicare eligibility and Part A and B claims data were used to assess the effects of the demonstration on the utilization and costs of chiropractic services and other medical services in beneficiaries with NMS diagnoses. Medicare Part D had not been implemented when the demonstration began. Results in demonstration counties are compared with those in comparison counties matched two-to-one on a range of health care cost and utilization characteristics. Analyses focus on two beneficiary groups - those who received any treatment for NMS diagnoses and those who received chiropractic services – during the year before the demonstration or the two years during which it was conducted. Difference-in-difference statistics are used to compare trends in the use and costs of medical services in demonstration and comparison counties. Hence, the analysis controls for extraneous factors that may have affected the use and costs of Medicare services.

Effects on the Use of Chiropractic Services: Medicare claims data revealed high rates of claims for the expanded chiropractic services before the demonstration began in both demonstration and comparison areas, even though payment was denied. Chiropractors appeared to be submitting these claims either at the beneficiary's request or to obtain

Medicare’s denial so they could bill other carriers. This analysis of the use of expanded chiropractic services focused on claims submitted rather than claims paid under the assumption that both paid and denied claims represent services that were actually received by beneficiaries. The analysis of Medicare expenditures, however, relies on paid claims.

The number of Medicare beneficiaries who used any chiropractic services increased by 9 and 13 percent, respectively, during the first and second years of the demonstration in demonstration areas relative to comparison areas. Slightly larger corresponding increases of 12 and 16 percent occurred in users of expanded chiropractic services (**Table 1**). Users of other (non-chiropractic) NMS services decreased in demonstration areas by 19 percent in each year (odds ratios 0.81). As indicated previously, these findings are based on claims submitted rather than bills paid by Medicare.

Table 1: Demonstration-induced Changes in Users of NMS-related Services – All Beneficiaries with NMS Diagnoses *

Time Periods	Odds Ratio for the Use of Other NMS Services	p-value	Odds Ratio for the Use of Any Chiropractic Services	p-value	Odds Ratio for the Use of Any Expanded Chiropractic Services	p-value
1st Demo Yr. vs. Pre-Demo Yr.	0.81	<0.0001	1.09	<0.0001	1.12	<0.0001
2nd Demo Yr. vs. Pre-Demo Yr.	0.81	<0.0001	1.13	<0.0001	1.16	<0.0001

*Calculations of the percentage of service users, both before and during the demonstration, reflect all claims billed to Medicare, whether paid or denied.

Table 2 presents trends in the use of different types of services by beneficiaries who used expanded chiropractic services. Visits that included expanded services increased progressively from 15 percent during the first 6 months of the demonstration to 84 percent during its final 6 months; while those for any type of chiropractic service increased during the second year of the demonstration but not during its first year. This finding reflects the overall increase in users of expanded services shown in **Table 1**. Visits for other types of NMS services in these individuals did not change significantly.

Table 2: Demonstration-induced Changes in NMS-related Visits in Expanded Chiropractic Service Users *

Time Periods	Visits for other NMS Services	p-value	Total Visits for Any Chiropractic Services	p-value	Visits for Expanded Chiropractic Services	p-value
Summer '05 vs. Summer '04	0.00	0.978	-0.14	0.22	1.15	<0.0001
Winter '05-'06 vs. Winter '04-'05	0.16	0.005	0.05	0.69	1.75	<0.0001
Summer '06 vs. Summer '04	0.10	0.115	-0.35	0.003	1.64	<0.0001
Winter '06-07 vs. Winter '04-'05	0.04	0.261	0.81	<0.0001	1.84	<0.0001

*Calculations of visits per expanded service user, both before and during the demonstration, reflect all office visits by the beneficiary, including denials. The numbers of visits are for 6-month periods.

Effects on Medicare Expenditures: Medicare expenditures for expanded chiropractic services increased by \$152 to \$195 per 6-month period in users of expanded chiropractic services in demonstration areas ($p < 0.0001$) (**Table 3**). Increases in any chiropractic services are similar and were driven by the costs of expanded services. Small, but statistically significant, increases of \$12 to \$27 per 6-month period occurred in payments for non-chiropractic NMS services.

Table 3: Demonstration-induced Changes in Medicare Reimbursements for NMS-related Services – Expanded Chiropractic Service Users *

Time Periods	Payments for Other NMS Services	p-value	Payments for Any Chiropractic Services	p-value	Payments for Any Expanded Chiropractic Services	p-value
Summer '05 vs. Summer '04	\$12	0.14	\$153	<0.0001	\$152	<0.0001
Winter '05-'06 vs. Winter '04-'05	\$27	<0.0001	\$192	<0.0001	\$182	<0.0001
Summer '06 vs. Summer '04	\$23	<0.0001	\$185	<0.0001	\$192	<0.0001
Winter '06-07 vs. Winter '04-'05	\$16	<0.0001	\$184	<0.0001	\$195	<0.0001

* Payments are per user for the indicated 6-month period

In total, Medicare expenditures for chiropractic services in expanded service users increased by \$56.2 million more in demonstration than comparison areas, including an additional \$34.8 million for expanded chiropractic services and an additional \$21.3 million for standard chiropractic services because of the increased numbers of expanded chiropractic users (**Table 4**). The demonstration's effects varied between urban and rural areas and between Health Professional Shortage Areas (HPSA) and non-HPSA Areas. Both total and per-person increases in Medicare payments were largest in urban/non-HPSA areas.

Table 4: Total Expenditures for Chiropractic Services in Demonstration and Comparison Regions - Expanded Chiropractic Services Users

Time Period	Expenditures for Expanded Chiropractic Services (millions \$)	Expenditures for Standard Chiropractic Services (millions \$)	Expenditures for All Chiropractic Services (millions \$)
Demonstration Areas			
Pre-Demo Year	\$0.0	\$12.0	\$12.0
During Demo			
Year 1	\$15.7	\$20.9	\$36.7
Year 2	\$19.1	\$21.7	\$40.8
Total	\$34.8	\$42.7	\$77.5
Comparison Areas			
Pre-Demo Year	\$0.0	\$10.0	\$10.0
During Demo			
Year 1	\$0.0	\$10.8	\$10.8
Year 2	\$0.0	\$10.5	\$10.5
Total	\$0.0	\$21.3	\$21.3
Difference	\$34.8	\$21.3	\$56.2

Analysis of Budget Neutrality: This analysis responded to Congress’ requirement under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Public Law 108-173) that the Secretary ensure that aggregate payments under the Medicare program for the demonstration of expanded coverage for chiropractic services not exceed the amount which the Secretary would have paid under the Medicare program if the demonstration was not implemented.

The analysis focused on two groups of beneficiaries: (1) all those who were treated for NMS diagnoses in the demonstration areas (All NMS User Analysis) and (2) the subgroup of individuals with NMS diagnoses who received chiropractic services (Chiropractic User Analysis). The fundamental question is whether increased Medicare

payments for chiropractic services under the demonstration were accompanied by offsetting reductions in payments for all institutional services (hospitalizations, skilled nursing home care) or non-chiropractic ambulatory services.

Analysis of All NMS Users: Total Medicare reimbursements increased by \$114 million in the 1,049,963 beneficiaries in demonstration areas who were treated for NMS diagnoses. Of this amount, \$55 million were for institutional services and \$59 million were for non-institutional services. This total increase was 3.3 times the \$34.8 million shown in **Table 4** as the direct costs for expanded chiropractic services under the demonstration. Corresponding per-person increases in reimbursements were \$109 for all Medicare services, \$52 for institutional services, and \$56 for non-institutional (largely ambulatory) services (**Table 5**). Per-person increases were greater in Year 2 of the demonstration for non-institutional and all Medicare services, but the increase was lower in Year 2 for institutional (hospital) services.

Table 5: Demonstration Effects for All Beneficiaries with NMS Diagnoses

Type of Service	Baseline Payments Per Person	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Millions \$ (SE)
Institutional	\$470	\$32** (\$5)	\$21** (\$5)	\$52** (\$9)	\$55** (\$10)
Non-institutional	\$577	\$10** (\$3)	\$47** (\$3)	\$56** (\$4)	\$59** (\$5)
All Medicare Covered Services	\$1,047	\$42** (\$7)	\$67** (\$7)	\$109** (\$11)	\$114** (\$12)

Positive numbers indicate higher costs associated with the demonstration. Separate effects in Year 1 and Year 2 are per beneficiary with an NMS diagnosis. Components may not add exactly to totals due to rounding. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Effectively all of the increase in both total and per-person costs occurred in urban non-HPSA areas. Small, but statistically significant, reductions in costs were found in rural HPSA areas (**Table 6**).

Table 6: Breakdown of Demonstration Effects by Market Area in the All NMS Analysis

Market Area	NMS Beneficiaries	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect Millions \$ (SE)
Urban Non-HPSA	779,620	\$55** (\$8)	\$94** (\$8)	\$149** (\$14)	\$116** (\$11)
Urban HPSA	8,979	\$32 (\$50)	-\$46 (\$50)	-\$13 (\$87)	\$0.1 (\$0.8)
Rural Non-HPSA	220,534	\$22 (\$13)	-\$5 (\$13)	\$17 (\$23)	\$4 (\$5)
Rural HPSA	40,830	-\$142** (\$28)	\$9 (\$28)	-\$133** (\$49)	-\$5* (\$2)
All NMS Beneficiaries	1,049,963	\$42** (\$7)	\$67** (\$7)	\$109** (\$11)	\$114** (\$12)

Positive numbers indicate higher costs associated with the demonstration. Separate effects in Year 1 and Year 2 are per beneficiary with an NMS diagnosis. Components may not add exactly to totals due to rounding. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

The breakdown of All NMS User results by state indicates that Illinois counties accounted for all of both total and per-person increases in costs (**Table 7**). Increases in costs in Illinois were offset by significant reductions in Maine, New Mexico, and Virginia. Within Illinois, Chicago and its suburbs accounted for 88% of total increase in costs (\$128 of \$145 million).

Table 7: Breakdown of Demonstration Effects by State in the All NMS Analysis

State	Number of NMS Beneficiaries Served in Demonstration Regions	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Million \$ (SE)
Illinois	681,063	\$73** (\$8)	\$140** (\$8)	\$213** (\$15)	\$145** (\$10)
Iowa	14,952	-\$56 (\$46)	-\$92* (\$46)	-\$148 (\$79)	-\$2 (\$1)
Maine	139,237	-\$5 (\$23)	-\$104** (\$23)	-\$109** (\$40)	-\$15* (\$6)
New Mexico	130,592	-\$119** (\$16)	\$9 (\$16)	-\$110** (\$27)	-\$14** (\$4)
Virginia	84,119	\$52** (\$19)	-\$130** (\$19)	-\$78* (\$33)	-\$7* (\$3)
All NMS Beneficiaries	1,049,963	\$42** (\$7)	\$67** (\$7)	\$109** (\$11)	\$114** (\$12)

Positive numbers indicate higher costs associated with the demonstration. Separate effects in Year 1 and Year 2 are per beneficiary with an NMS diagnosis. Components may not add exactly to totals due to rounding. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Analysis of Chiropractic Users: Chiropractic users in demonstration areas included 14.3 percent of the total number of beneficiaries with NMS diagnoses. Medicare reimbursements increased by a total of \$50 million in these individuals, 90 percent which was for non-institutional (ambulatory) services (**Table 8**). The increase in the costs of institutional services was not statistically significant. Patterns of change by type of market area and by state were similar to those in the All NMS Users analysis. Illinois accounted for 80 percent of the total increase in costs and also had the highest per-person increases in costs of \$485 per person compared with increases of \$136 per person in Virginia and \$35 in Maine and decreases in the other two states (**Table 9**). Chicago and its suburbs accounted for 80 percent of the total cost increase in Illinois and had increases in per-person costs that were 4.6 times higher than those in all other demonstration areas combined.

Table 8: Demonstration Effects by Type of Service in the Chiropractic User Analysis

Type of Service	Per Person Payments during the Pre-Demo Year	Effect per User in Year 1 (SE)	Effect per User in Year 2 (SE)	Total Effect per User (SE)	Total Effect in Millions \$ (SE)
Institutional	\$364.86	\$17 (\$12)	\$18 (\$12)	\$35 (\$21)	\$5 (\$3)
Non-institutional	\$764.61	\$117** (\$7)	\$170** (\$7)	\$287** (\$12)	\$45** (\$2)
All Medicare Covered	\$1,129.48	\$134** (\$16)	\$188** (\$16)	\$322** (\$27)	\$50** (\$4)

Positive numbers indicate higher costs associated with the demonstration. Standard errors are in parentheses. Separate effects in Year 1 and Year 2 are per user of expanded chiropractic services. Components may not add exactly to totals due to rounding. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Table 9: Breakdown of Demonstration Effects by State in the Chiropractic User Analysis

State	Chiropractic Users	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Million \$ (SE)
Illinois	101,793	\$201** (\$19)	\$283** (\$19)	\$485** (\$33)	\$49** (\$3)
Iowa	6,211	-\$63 (\$112)	-\$115 (\$112)	-\$178 (\$195)	-\$1 (\$1)
Maine	18,916	\$40 (\$61)	-\$5 (\$61)	\$35 (\$105)	\$1 (\$2)
New Mexico	21,754	-\$78 (\$43)	\$19 (\$43)	-\$59 (\$74)	-\$1 (\$2)
Virginia	6,412	\$131** (\$61)	\$5 (\$61)	\$136 (\$106)	\$1 (\$1)
All Chiropractic Users	155,086	\$134** (\$16)	\$188** (\$16)	\$322** (\$27)	\$50** (\$4)

Positive numbers indicate higher costs associated with the demonstration. Standard errors are in parentheses. Separate effects in Year 1 and Year 2 are per user of expanded chiropractic services. Components may not add exactly to totals due to rounding. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Summary of Findings and Discussion: The demonstration increased Medicare payments for expanded chiropractic services by \$34.8 million. The All NMS User analysis found a total increase in Medicare costs of \$114 million, a figure 3.3 times those for expanded chiropractic services alone. The Chiropractic User analysis found a total increase of \$50 million or 1.4 times the amount for expanded chiropractic services.

Table 10 summarizes these results.

Table 10: Summary of Demonstration Effects on Medicare Costs (millions of dollars)

	Total Cost Difference	Direct Costs of Expanded Chiropractic Services	Costs for Other Types of Services
All NMS User Analysis*	\$114.0	\$34.8	\$79.2
Chiropractic User Analysis	\$50.0	\$34.8	\$15.2

* NMS denotes neuromusculoskeletal.

Both analytic approaches identified important differences in the demonstration's impacts in different geographic areas. Illinois, and especially Chicago and its immediate suburbs, accounted for almost all of increases in both per-person and total costs. Costs in other demonstration areas either increased by small amounts or actually decreased.

The All NMS User and Chiropractic User analysis each has strengths and limitations. The former avoids selection effects by including all beneficiaries who were potential targets for chiropractic services under the demonstration. At the same time, its results are affected significantly by changes in the costs of care for the 86 percent of individuals who did not receive any chiropractic services. The Chiropractic User analysis, on the other hand, directly reflects the impact of expanded coverage for chiropractic services but may miss unintended effects of the demonstration on services provided by other types of health care professionals.

IV. Summary of Results and Conclusions

Demonstration Implementation: The demonstration experienced a slow ramp-up during its first year due to difficulties in implementing its billing system and low chiropractor participation, but achieved satisfactory steady-state operations during its second year. Only about 40 percent of eligible chiropractors participated in the demonstration, and only half of chiropractic service users in demonstration areas reported they were aware that the demonstration was being conducted.

Survey of Chiropractic Service Users: Medicare beneficiaries reported good relief of symptoms and high degrees of satisfaction with the chiropractic care they had received. Nearly 70 percent of survey respondents indicated that they had insurance, in addition to Medicare, that covered chiropractor services.

Effects of Expanded Coverage on Use of Chiropractic Services and Medicare

Expenditures: Among users of expanded chiropractic services, visits increased by 60 percent overall and related Medicare expenditures increased by \$34.8 million.

Analysis of Budget Neutrality: Medicare reimbursements increased by \$34.8 million for expanded chiropractic services. Reimbursements for all Medicare services increased by \$114 million if the analysis included all beneficiaries with NMS diagnoses or by \$50 million if it was based on chiropractic service users. Essentially all of increased costs occurred in urban non-HPSA areas and in Illinois and, especially, in Chicago and its suburbs.