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Final Report

Evaluation of the Demonstration of Expanded Coverage of Chiropractic

Services under Medicare

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ABBREVIATIONS

Abbreviation	Meaning
ACA	American Chiropractic Association
AHCPR	Agency of Health Care Policy and Research
CAs	chiropractic assistants
CMS	Centers for Medicare & Medicaid Services
DC	doctors of chiropractic
E&M	evaluation and management
ExpNP	expanded services users of nonparticipating chiropractors
ExpP	expanded services users of participating chiropractors
HPSA	health professional shortage area
ICA	the International Chiropractors Association
MMA	Medicare Prescription Drug, Improvement, and Modernization Act of 2003
NMS	neuromusculoskeletal
NS	not statistically significant
OMB	Office of Management and Budget
ORDI	Office of Research, Development and Information
PT	physical therapy
RCTs	randomized clinical trials
RTC	Report to Congress
StdS	standard services users
UPIN	Unique Provider Identification Number
WPS	Wisconsin Physicians Services

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
ABBREVIATIONS	iii
EXECUTIVE SUMMARY	viii
A. Background	viii
1. Overview	viii
2. Congressional Mandate	viii
3. Medicare Coverage for Chiropractic Services under the Demonstration	ix
B. Principal Components of the Report	ix
1. Implementation of the Demonstration	ix
2. Survey of Users of Chiropractic Services	x
3. Effects of Expanded Coverage on the Use and Costs of Chiropractic Services	x
4. Analysis of Budget Neutrality	x
C. Main Findings.....	xi
1. Implementation of the Demonstration	xi
2. Survey of Chiropractic Users	xii
3. Effects of the Demonstration on the Use and Costs of Chiropractic Services.....	xiii
D. Summary and Conclusions	xxiii
I. BACKGROUND	1
A. Overview	1
B. Congressional Mandate	1
C. Medicare Coverage of Chiropractic Services under the Demonstration.....	1
D. Chiropractic – Principles and Practice	2
E. Overview of this Report.....	4
II. DESIGN AND IMPLEMENTATION OF THE DEMONSTRATION	5
A. Overview	5
B. Objectives.....	5
C. Evaluation Methods	5
1. Discussions with Stakeholders	5
2. Reports from Carriers to CMS	7
D. Results	7
1. Key Implementation Issues.....	7
2. Medicare Part B Carriers Experiences during the Demonstration.....	8
3. Chiropractors Reactions to the Demonstration	9
E. Summary of Findings	15
1. Main Issues during Demonstration Implementation.....	15
2. Effects of the Demonstration.....	16
3. Strengths and Limitations of this Evaluation of Demonstration Implementation.....	16
III. SURVEY OF MEDICARE BENEFICIARY USERS OF CHIROPRACTIC SERVICES	17
A. Overview	17
B. Survey Design.....	17
1. Survey Methods:	17
2. Survey Sample.....	18
3. Analysis Plan.....	18
C. Survey Results.....	19
1. Demographic Characteristics.....	19
2. General Health of Respondents.....	19
3. Awareness of the Chiropractic Demonstration	20
4. Chiropractic Care: Reasons, Symptoms, Responses, and Benefits	21

5. Satisfaction with Chiropractic Care	26
6. Prior Treatments for the Same Problem	27
7. Health Insurance Coverage	29
8. Out-of-pocket Costs	29
D. Summary and Discussion	30
1. Summary of Findings	30
2. Limitations of the Survey.....	31
IV. EFFECTS OF THE DEMONSTRATION ON THE UTILIZATION AND COSTS OF CHIROPRACTIC SERVICES	32
A. Overview and Objectives	32
1. Overview	32
2. Goals and Objectives	32
B. Analytic Methods	33
1. Data Sources	33
2. Matched Comparison Counties.....	33
3. Analytic Approaches	34
C. Results	39
1. Effects of the Demonstration on User Rates of NMS-related Services	39
3. Effects of the Demonstration on Medicare Reimbursements	45
4. Effects of the Demonstration on Expanded Service Users and Reimbursements in Urban/Rural and HPSA/non-HPSA Locations	49
5. Effects of the Demonstration on Reimbursements in Different Diagnostic Groups	50
6. Denial Rates of Claims during the Demonstration.....	52
D. Summary and Discussion	55
V. ANALYSIS OF BUDGET NEUTRALITY OF THE DEMONSTRATION	58
A. Objectives.....	58
B. Background	58
C. Methods	58
D. Results	63
E. Discussion	75
F. Conclusions.....	76
REFERENCES.....	78
APPENDICES.....	79
Appendix A. Federal Register Description of the Demonstration.....	80
Appendix B. Expanded Coverage of Chiropractic Services: Diagnostic and Procedure Codes	84
Appendix C. Interview Guides for Chiropractic Associations, Practicing Chiropractors, and Medicare Part B Carriers: Initial and Follow-up Interviews	89
Appendix D. Dates and Locations of Interviews Conducted During Implementation of the Demonstration	93
Appendix E. Survey of Medicare Beneficiaries Who Are Using Chiropractic Services	95
Appendix F. Demonstration and Matched Comparison Counties	102
Appendix G. Technical Note on Border Crossing.....	104
Appendix H. Effects of the Demonstration on Medicare Costs Using Alternatives to Per-Person Weighting.....	106

TABLES

EXECUTIVE SUMMARY

Table 1: Demonstration-induced Changes in Users of NMS-related Services – All Beneficiaries with NMS Diagnoses *	xiv
Table 2: Demonstration-induced Changes in NMS-related Visits in Expanded Chiropractic Service Users *	xv
Table 3: Demonstration-induced Changes in Medicare Reimbursements for NMS-related Services – Expanded Chiropractic Service Users *	xvi
Table 4: Total Expenditures for Chiropractic Services in Demonstration and Comparison Regions - Expanded Chiropractic Services Users	xvii
Table 5: Demonstration Effects for All Beneficiaries with NMS Diagnoses	xviii
Table 6: Breakdown of Demonstration Effects by Market Area in the All NMS Analysis	xix
Table 7: Breakdown of Demonstration Effects by State in the All NMS Analysis	xx
Table 8: Demonstration Effects by Type of Service in the Chiropractic User Analysis	xxi
Table 9: Breakdown of Demonstration Effects by State in the Chiropractic User Analysis	xxii
Table 10: Summary of Demonstration Effects on Medicare Costs (Millions of Dollars)	xxii
Table 2.1: Chiropractors' Participation in the Demonstration *	11
Table 2.2: Frequent Reasons for Denials Reported by Carriers	12
Table 2.3: Frequent Services Billed under Expanded Coverage during the Demonstration	14
Table 3.1. Numbers of Sampled Beneficiaries and Respondents	18
Table 4.1: Outcomes	38
Table 4.2: Classifying Variables for Subgroups	38
Table 4.3: User Rates in Demonstration and Comparison Regions - by Type of Service *	40
Table 4.4 Demonstration-induced Changes in Users of NMS-related Services – All Beneficiaries with NMS Diagnoses	41
Table 4.5: Visit Rates per User in Demonstration and Comparison Regions - Expanded Chiropractic Service Users *	42
Table 4.6: Demonstration-induced Changes in NMS-related Visits - Expanded Chiropractic Service Users *	43
Table 4.7: Visit Rates per User in Demonstration and Comparison Regions - All Chiropractic Users	44
Table 4.8: Demonstration-induced Changes in Visits for NMS-related Services - All Chiropractic Service Users *	45
Table 4.9: Medicare Reimbursements for Chiropractic Services in Beneficiaries with NMS Diagnoses in Demonstration and Comparison Regions - Expanded Chiropractic Service Users*	46
Table 4.10: Demonstration-induced Changes in Medicare Reimbursements for NMS-related Services – Expanded Chiropractic Service Users *	47
Table 4.11: Medicare Reimbursements per Six-Month Period - All Chiropractic Service Users *	48
Table 4.12: Demonstration-induced Effects on Reimbursements for NMS-related Services - All Chiropractic Service Users *	48
Table 4.13: Total Expenditures for Chiropractic Services in Demonstration and Comparison Regions - Expanded Chiropractic Services Users	49
Table 4.14: Effects of the Demonstration on the Numbers of Expanded Chiropractic Service Users and Reimbursements Per User in Urban or Rural and HPSA or non-HPSA Locations*	50
Table 4.15: Effects of the Demonstration on Reimbursements for NMS-related Services by Diagnostic Group	51
Table 4.16: Denial Rates for All Expanded Service Claims in Demonstration Areas*	54
Table 4.17: Claims Denial Rates for Expanded Services with the Demonstration Code “45” in Demonstration Areas *	54
Table 5.1: Demonstration Effects for All Beneficiaries with NMS Diagnoses	64
Table 5.2: Breakdown of Demonstration Effects by Diagnostic Group in the All NMS Analysis	65
Table 5.3: Breakdown of Demonstration Effects by Market Area in the All NMS Analysis	66
Table 5.4: Breakdown of Demonstration Effects by State in the All NMS Analysis	67
Table 5.5: Breakdown of Demonstration Effects between the Chicago Area and All Other Demonstration Areas in the All NMS Analysis	67
Table 5.6: Breakdown of Demonstration Effects by Type of Service in the Chiropractic User Analysis	68

Table 5.6: Breakdown of Demonstration Effects by Type of Service in the Chiropractic User Analysis	69
Table 5.7: Breakdown of the Demonstration Effects by Diagnosis Group in the Chiropractic User Analysis	70
Table 5.8: Breakdown of Demonstration Effects by Type of Market Area in the Chiropractic User Analysis	71
Table 5.9: Breakdown of Demonstration Effects by State in the Chiropractic User Analysis	72
Table 5.10: Breakdown of Demonstration Effects between the Chicago Area and other Demonstration Areas in the Chiropractic User Analysis	73
Table 5.11: Demonstration Effects on Medicare Costs Overall and by Type of Service (in Millions of Dollars)	73
Table 5.12: National Estimate of Medicare Costs by Market Area in the All NMS Analysis	74
Table 5.13: National Estimate of Medicare Costs by Market Area in the Chiropractic User Analysis	75
Table H.1: Demonstration Effects on Costs by Type of County Weighting (in Millions)	108

FIGURES

CHAPTER III

Figure 3.1: Gender, Household Size, and Education of Respondents	19
Figure 3.2: Patient-reported General Health and Medical Problems	20
Figure 3.3: Patient-reported Sources of Information about Medicare’s Expanded Coverage for Chiropractic Services	21
Figure 3.4: Patient-reported Reasons for Seeking Chiropractic Care	22
Figure 3.5: Patient-reported Body Parts Affected by the Worst Symptom	23
Figure 3.6: Patient-reported Types of Symptoms	23
Figure 3.7: Patient-reported Severity of Symptoms and Degree of Interference with Daily Activities at the First Visit to the Chiropractor	24
Figure 3.8: Patient-reported Types of Treatments Received from Chiropractors	25
Figure 3.9: Patient-reported Relief of Symptoms from Chiropractic Treatments	25
Figure 3.10: Patient-reported Interference of Symptoms with Usual Activities after Treatment	26
Figure 3.11: Scores on Quality-of-care Indicators for Chiropractic Care	27
Figure 3.12: Patient-reported Types of Treatments Received from Other Health Care Professionals	28
Figure 3.13: Patient-reported Degree of Symptom Relief Obtained from Other Health Professionals	28
Figure 3.14: Chiropractic Services for which Increased Medicare Coverage is Especially Important	29
Figure 3.15: Patient-reported Out-of-pocket Expenses	30

CHAPTER IV

Figure 4.1: Cohorts Used for Medicare Utilization and Expenditure Comparisons	35
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APPENDIX

Figure H.1: Histogram of Demonstration Effects by County under All NMS and Chiro User Analyses ..	107
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EXECUTIVE SUMMARY

A. Background

1. 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.

2. 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.

3. 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?

B. 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.

1. 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.

2. 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

3. 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.

4. 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.

C. Main Findings

1. 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.

2. 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.

3. 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		Odds Ratio for the Use of Any Chiropractic Services		Odds Ratio for the Use of Any Expanded Chiropractic Services	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
1st Demo Year vs. Pre-Demo Year	0.81	<0.0001	1.09	<0.0001	1.12	<0.0001
2nd Demo Year vs. Pre-Demo Year	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
<i>During Demo</i>			
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
<i>During Demo</i>			
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 Million \$ (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 (\$0.80)
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	1049963	\$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 (SE) 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.

D. Summary 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 Users of Chiropractic Services: 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 and Costs of Chiropractic and All Medicare Services:

Among users of expanded chiropractic services, office visits increased by 60 percent and expenditures for ambulatory services increased by \$34.8 million. Reimbursements for all Medicare services increased by \$114 million when the analysis included all beneficiaries with NMS diagnoses or by \$50 million in chiropractic service users. The large majority of cost increases occurred in urban non-HPSA areas and, especially, in Chicago, IL and its suburbs.

I. BACKGROUND

A. Overview

This Report to Congress (RTC) presents the findings of an independent evaluation of the Centers for Medicare & Medicaid Services' (CMS's) Demonstration of Coverage of Chiropractic Services under Medicare. The demonstration, conducted from April 1, 2005 through March 31, 2007, provided expanded coverage for chiropractic services in four regions of the United States, including the entire states of Maine and New Mexico, 26 counties in northern Illinois plus Scott County in Iowa, and 17 counties in central Virginia. These regions explicitly included representation of urban and rural and Health Provider Shortage Areas (HPSA). This report examines implementation of the demonstration, presents the results of a survey of Medicare beneficiaries who received chiropractic care in the demonstration areas, assesses the effects of the demonstration on the use and costs of chiropractic services, and assesses the overall budget neutrality of the Demonstration.

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) "to expand coverage for chiropractic services under Medicare beyond the current coverage for manipulation to correct neuromusculoskeletal (NMS) conditions typical among eligible beneficiaries, and would cover diagnostic and other services that a chiropractor is legally authorized to perform by the State or jurisdiction in which the treatment is provided." (Federal Register, January 28, 2005; see **Appendix A**). The demonstration was to last for two years and be conducted in four sites, two rural and two urban, with one site of each area type being 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 to recoup any such additional payments. Specific conditions applied by CMS were: (1) that any chiropractor who provided services in these geographic areas was to be eligible to participate; (2) that any beneficiary enrolled under Medicare Part B was to be eligible to receive services; and (3) that 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.

C. Medicare Coverage of Chiropractic Services under the Demonstration

At present, Medicare covers only three CPT codes for manual manipulation of the spine to correct subluxations, which chiropractors define as 'malfunctions of the spine'. Under the demonstration, coverage was expanded to include a broad range of neuromusculoskeletal (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. Additional covered services included manipulations of the extremities (extraspinal manipulations), a variety of PT modalities such as electrostimulation and ultrasound,

evaluation and management (E&M) visits, and diagnostic tests such as blood tests and x-rays, CT scans, and MRIs.

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

D. Chiropractic – Principles and Practice

Chiropractic is a growing health care profession that in 2005 included 69,000 licensed doctors of chiropractic (DC) (National Board of Chiropractic Examiners 2005). It is “very much at the crossroads of alternative and mainstream medicine” (Meeker and Haldeman 2002). The word “chiropractic” is from the Greek *cheira* and *praktikos* meaning “done by hand”, and its clinical goal is to diagnose and treat mechanical disorders of the spine and musculoskeletal system with the intention of affecting the nervous system and improving health.

The modern chiropractic profession dates from 1895 when Daniel David Palmer gave his first spinal adjustment and founded the first chiropractic college (Palmer Institute) in Davenport, Iowa. Chiropractors attend a four-year medical school that has approximately the same number of classroom and clinical hours as medical physicians. A National Board of Chiropractic Examiners was established in 1963 and, at present, 46 states either recognize or require passage of examinations by this body (NBCE 2005).

Landmarks in the development of chiropractic in the United States include Medicare’s decision to provide coverage for spinal manipulation in the 1970s; the U.S. Supreme Court’s decision in 1987 to uphold a lower court decision that found the AMA guilty of antitrust violations in its attempt to eliminate the chiropractic profession; and the conclusion of a consensus panel convened by the Agency of Health Care Policy and Research (AHCPR) in 1994 that rated spinal manipulation as an effective treatment for back pain (Bigos, et al. 1994).

The core clinical action of chiropractic is spinal manipulation or “adjustment” that involves the “application of a load (force) to specific body tissues with therapeutic intent” (Meeker and Haldeman 2002) and is directed at a dysfunctional joint “lesion” known as a subluxation. A subluxation, in turn, is a form of joint sprain with clinically associated hypomobility, malalignment, local and referred pain, inflammation, and muscle tension (Gatterman 1995). In addition to spinal manipulations, many chiropractors also provide manipulations of the extremities; PT involving the use of heat, cold, electrostimulation, and rehabilitation

methods; and counseling about nutrition, the use of vitamins and nutritional supplements, weight loss, smoking cessation, and relaxation techniques. (Meeker and Haldeman 2002). Chiropractors frequently serve as primary care physicians, especially for patients with chronic back symptoms. A survey of chiropractors published in 2003 (NBCE 2005), found, among other things, that 60 percent of chiropractors' patients are female and 13.7 percent are 65 years of age or older. Most patients go to chiropractors for musculoskeletal problems, especially back pain, but also for head, neck, and extremity symptoms. More than half of patients have chronic symptoms, often with acute exacerbations. Less common reasons for seeking care include infantile colic, asthma, dysmenorrhea, carpal tunnel syndrome, and hypertension.

Questions remain about the efficacy of chiropractic treatments despite the AHCPR's 1994 report that concluded that spinal manipulation was safe and effective for acute low back pain with a moderate "B" level of confidence, the same level of confidence assigned to the use of non-steroidal anti-inflammatory drugs. More than 73 randomized control trials (RCTs) have been published, many in mainline medical journals, with most examining chiropractic in patients with low back, neck or head pain and most comparing spinal manipulations to placebos, PT, or analgesics (Meeker and Haldeman 2002). Assendelft's meta-analysis concluded that "spinal manipulative therapy was superior only to sham therapy" in patients with acute back pain and "had no statistically or clinically significant advantage over general practitioner care, analgesics, PT exercises, or back surgery." Results were similar in patients with chronic low back pain (Assendelft et al. 2003). In a particularly rigorous RCT, Cherkin et al. studied 321 patients with low back pain that had persisted for at least 7 days after a primary care visit and concluded that chiropractor manipulation and the McKenzie method of PT had similar effects and costs, and that patients receiving one of these therapies had only marginally better outcomes than those who received the minimal intervention of an educational booklet (Cherkin et al. 1998.).

Part of the strength of chiropractic may lie in the "domain of the art of healing and how the chiropractic profession negotiates the patient-physician relationship" and that "Chiropractic finds its voice exactly where biomedicine becomes inarticulate" (Kaptchuk and Eisenberg 1998). Further, Kaptchuk points out that "the chiropractor provides the patient with a structured, supportive environment and theoretical explanations designed to take the mystery out of the process and problems" (Kaptchuk and Eisenberg 1998). These perceptions of patient-physician interactions may indeed provide strong inducements for patients to rely upon chiropractors.

In conclusion, available studies provide substantial, but inconclusive, support for the efficacy of chiropractic interventions in the treatment of acute and chronic back pain.

E. Overview of this Report

This report presents the results of the evaluation of four major aspects of the demonstration:

1. Issues that arose during its implementation;
2. Views of Medicare beneficiaries who received chiropractic services on the relief of symptoms experienced, satisfaction with services, and out-of-pocket expenses incurred;
3. Effects on the use and costs of chiropractic services; and
4. Effects on overall Medicare payments and, hence, its budget neutrality. Budget neutrality is particularly important because of Congress' concern over the solvency of the Medicare Trust Fund.

Findings are based on discussions with CMS and the ACA, chiropractic associations, practicing chiropractors, and Medicare carriers; a survey of Medicare beneficiaries; and the analysis of Medicare claims for targeted population of beneficiaries with neuromusculoskeletal (NMS) diagnoses.

Results are presented as follows:

Chapter II: Design and Implementation of the Demonstration.

Chapter III: Survey of Medicare Beneficiary Users of Chiropractic Services

Chapter IV: Effects of the Demonstration on the Utilization and Costs of Chiropractic Services.

Chapter V: Analysis of the Budget Neutrality of the Demonstration.

II. DESIGN AND IMPLEMENTATION OF THE DEMONSTRATION

A. Overview

The demonstration began on April 1, 2005 and ended on March 31, 2007 and was conducted in the entire states of Maine and New Mexico, selected counties in central Virginia and northern Illinois, and Scott County in eastern Iowa. It extended Medicare coverage from spinal manipulation for subluxations of the spine to a broad range of NMS diagnoses and a broad range of services including extraspinal manipulation (of the extremities), evaluation and management (E & M) visits, PT services, laboratory tests, x-rays, and authorization to refer patients to relevant specialists for MRIs and CT scans. **Appendix B** provides covered diagnoses and services.

Eligible fee-for-service beneficiaries were required to have a participating chiropractor and to be enrolled in Medicare Part B. Claims for services provided under the demonstration were processed by the Medicare Part B carriers for participating areas. Chiropractors in the demonstration areas were eligible to participate if they had been approved by Medicare and issued a Unique Provider Identification Number (UPIN). To obtain reimbursement for services covered under the demonstration, they had to submit two bills for each patient visit – one for standard chiropractic services provided and the second for expanded coverage services. Carriers were responsible for educating chiropractors about billing procedures, processing claims, and responding to chiropractors' questions.

B. Objectives

This chapter examines key issues that arose during implementation and how these were addressed including the experiences of Medicare's Part B carriers; chiropractors' perspectives on their experiences during the demonstration; and its effects on the use of chiropractic services and denial rates of Medicare claims.

C. Evaluation Methods

1. Discussions with Stakeholders

The evaluators met with each of the key parties to the demonstration during Spring 2006 near the end of its first year and then again in Spring 2007. These included:

- Division of Health Promotion and Disease Prevention Demonstrations, Office of Research, Development, and Information (ORDI), CMS
- American Chiropractic Association (ACA),
- state chiropractic associations in demonstration areas,
- practicing chiropractors, and
- Medicare Part B carriers for demonstration areas

Discussions were guided by established qualitative research methods and semi-structured discussion guides. This approach allowed participants to identify issues that were important to them while increasing the comparability of responses. Broad questions were asked in key areas of analytical concern and were then followed by detailed questions to elicit specific information. The initial questions allowed knowledgeable respondents to introduce information that they deemed to be important, and follow-up probes allowed other important issues to be explored.

Officials at CMS and the ACA were interviewed during site visits to Baltimore, MD and Arlington, VA, respectively. Meetings with most state chiropractic associations were conducted during site visits and were supplemented by telephone conference calls. Practicing chiropractors were interviewed in their offices or by telephone. Carriers were interviewed during telephone conference calls with the staff members who were responsible for implementing the demonstration. Interview guides are provided in **Appendix C**, and the date(s), locations, and the numbers of participants interviewed are summarized in **Appendix D**.

Meetings with CMS's ORDI and the ACA were directed at both policy and process issue that arose during planning and implementation of the demonstration. The ACA, with about 18,000 members, is the largest professional association in the world representing doctors of chiropractic. It had lobbied vigorously for expanded coverage of chiropractic services and had interacted regularly with CMS during the planning and implementation phases of the demonstration. It also played important roles in providing outreach to state chiropractic associations and chiropractor education. The International Chiropractors Association (ICA), which has about 4,000 members in the US and offices in 50 countries, was contacted, but it was not possible to arrange an interview with its board. Its Executive Director, while thoroughly cooperative, indicated that the ICA did not support the demonstration because it believed that increased coverage could be obtained more readily by other means.

Meetings with representatives of state chiropractic associations focused on their roles in facilitating the demonstration and encouraging chiropractors to participate and on learning about the feedback they had received from practicing chiropractors. Interviews with practicing chiropractors were directed at understanding their perspectives on the demonstration's goals and on factors that influenced their decisions to participate or not participate. In interviews with practicing chiropractors, questions were directed at learning about the effects of the demonstration on the numbers of Medicare patients treated in their practices, the types of clinical problems treated, the spectrum of services provided, experiences with the demonstration's billing procedures, and net effects on practice incomes. It is important to emphasize that the chiropractors who participated in meetings with us were self-selected and did not represent a random sample of either all chiropractors or demonstration participants. Most were active members of their state associations or volunteers solicited by the association. A survey of randomly selected

chiropractors (participants and non-participants) would be needed to obtain more representative information.

Discussions with carriers focused on billing procedures, measurement of chiropractor participation and service utilization rates, customer service and outreach activities, and educational programs they conducted for chiropractors. The educational programs they conducted were evaluated by reviewing the slides they used and by attending an interactive session for chiropractors and their office managers conducted by the Illinois carrier coincident with a site visit to meet with chiropractic associations in Illinois and Iowa.

2. Reports from Carriers to CMS

Each carrier provided CMS with monthly, quarterly, and final service activity reports. These data were used to assess chiropractor participation rates; numbers of beneficiaries served; the use of chiropractic services; claims denial rates during the demonstration; dollar amounts of billed, allowed, and paid services; and the frequency of educational outreach activities.

D. Results

1. Key Implementation Issues

Informing Chiropractors and Medicare Beneficiaries about the Demonstration: CMS conducted an 'open-door forum' for chiropractors prior to the demonstration but relied primarily on the carriers, the ACA, and state chiropractic associations to inform chiropractors about the demonstration. In October 2005, six months after startup of the demonstration, CMS sent a letter to chiropractors in the demonstration areas in response to low chiropractor participation rates and chiropractors' complaints about Medicare carriers and high claims denial rates. Information for beneficiaries about the demonstration was included in a Medicare Summary Notice, but it is not clear how widely these notices are read by beneficiaries. The core assumption was that participating chiropractors would inform eligible beneficiaries when they sought chiropractic care.

Application of the "Incident to" Rule: The "incident to" rule requires the person who performs PT services under the direction of a physician to be a licensed physical therapist or a graduate of a program approved by the American Physical Therapy Association or the American Medical Association. Initially, CMS applied this rule to chiropractors in the demonstration exactly as it is applied to other physicians. The ACA objected and pointed out in a letter to Health and Human Services Secretary Michael Leavitt dated March 28, 2005 that "most doctors of chiropractic do not perform the therapy services themselves but rather direct their application by a staff member" (usually a chiropractic assistant (CA) who does not meet the above PT service certification requirements). The letter further stated its concern that application of the "incident to" regulation "would effectively negate the vast majority of therapy services

routinely provided by a doctor of chiropractic under state law....” and “would eliminate the vast majority of doctors of chiropractic from the demonstration project – negating the validity of the project’s results.”

CMS delayed implementation of the “incident to” rule early in the demonstration pending the outcome of a lawsuit brought by sports medicine trainers challenging it in another context. When this suit was denied in June 2005, CMS implemented a modified rule that, even though it would not reimburse chiropractors for services provided by CAs who did not meet certification requirements, did allow them to bill beneficiaries directly for PT services performed by CAs, provided the beneficiaries had agreed to be billed when they first received services under the demonstration.

Application of the “incident to” rule put chiropractors with non-qualifying CAs in the position of either: (1) having to take the time to perform the PT procedures themselves - hence slowing their practices, increasing patient waiting times, and reducing the numbers of patients they could see per hour or per day; (2) imposing financial burdens on their patients by billing them directly; (3) providing the services but foregoing payment; or (4) hiring a certified PT or qualifying CA to perform the services. Chiropractors complained that the rule had the effect of requiring them to treat Medicare beneficiaries differently from patients covered by other insurers. The end result was that its use caused some chiropractors to refuse to participate in the demonstration. CMS, on the other hand, explained that the use of the rule was responding directly to chiropractors’ request to be “treated like other physicians.”

Complexity of Billing under the Demonstration: Medicare billing is complex in its own right, and substantial changes can be expected to cause confusion and increase burdens on providers. The demonstration increased the complexity of billing in two ways: first, by requiring chiropractors to submit two bills for each patient visit - one for standard chiropractic services and another for expanded coverage services; and, second, by requiring that the demonstration code ‘45’ be inserted in the proper place on each expanded service claim. Appropriate use of Medicare’s set of “modifiers” was required on all bills in order to obtain reimbursement. Burdens of the demonstration’s billing system fell both on chiropractors and on Medicare’s Part B carriers, which had to implement it under very tight time constraints. Problems were greatest early in the demonstration because of limited preparation time and the need to play “catch-up”. Consequences were high claims denial rates, delayed reimbursements, and confusion and frustration among chiropractors, especially during the first year of the demonstration.

2. Medicare Part B Carriers Experiences during the Demonstration

Carriers indicated that the demands of the demonstration were considerable, even though the demonstration was not, by Medicare standards, a large undertaking. The total number of chiropractors impacted was in the thousands, and the number of bills generated was in the tens of thousands per month. Even this small scale caused difficulties, however, because of the efforts required to develop and

implement billing system changes, educate chiropractors and their office managers, respond to chiropractors' queries and complaints; and to comply with CMS's reporting requirements. Carriers were instructed by CMS to develop the billing system in a "change request" that described in detail the procedures to be followed. They took different approaches to implementation, however, and met with varying levels of success. According to the carriers, this was the most difficult Medicare demonstration they had ever participated in due to the complexity of billing, limited preparation time, and the problems chiropractors and their vendors experienced in implementing the billing system. One carrier struggled with manual claims processing for several months until it was able to implement electronic software. They claimed that the supplemental funding provided by CMS covered only a part of true implementation costs.

Chiropractor Education: The carriers devoted considerable time and effort to developing detailed operations manuals and conducting educational sessions for chiropractors and their office staffs, both in person and during teleconferences. Early in the demonstration, changes in the procedures and discrepancies between educational sessions conducted by the carriers and the ACA caused confusion among chiropractors. By the end of the first year, however, these educational efforts had improved considerably and had become more successful in reaching chiropractors. This success was particularly well exemplified by a seminar the evaluators attended in Illinois midway through the demonstration. This session included detailed formal presentations followed by open discussion about diagnostic and service codes, modifier codes, and procedures for responding to denials.

Customer Service: Services provided by carriers included staffing "help lines" for calls from chiropractors' offices about claims denials and billing questions. Carriers admitted that waits were often long and that customer service representatives were often inexperienced and insufficiently knowledgeable to provide definitive responses. Complaints from chiropractors' offices corroborated these problems. Important challenges for carriers' customer-service offices were encountered in adequately training and retaining relatively low-paid customer service representatives. Training challenges were compounded by the fact that questions from participating chiropractors represented only a tiny fraction of all questions received over these "help lines".

Outreach to Chiropractors: Each carrier assigned staff to conduct outreach to chiropractors' offices that had especially high claims denial rates or other types of problems. Procedures varied considerably from carrier to carrier and included both telephone contacts and office visits. These "retail" approaches were very time consuming but were generally well-received by chiropractors' offices and were felt by carriers to be effective in confronting problems.

3. Chiropractors Reactions to the Demonstration

Chiropractor's reactions to the demonstration were assessed in terms of their willingness to participate; experiences with billing procedures and claims denials; effects on practice costs; numbers and patterns of

services provided; and responses to the “incident to” rule. It is important to reemphasize that the chiropractors whose opinions are summarized below were self-selected and are not necessarily representative of all practicing chiropractors.

Chiropractor Participation Rates: Participation ranged from a low of 34 percent to a high of 56 percent in different demonstration regions and at different times during the demonstration. **Table 2.1** summarizes these by state at annual intervals. Participation increased slowly during the first 12 months of the demonstration in Illinois; decreased somewhat over time in Scott County, IA and New Mexico; and remained fairly constant in the other states. Participation was consistently highest in Maine. An important observation is that more than two-thirds of all participating chiropractors were from the northern Illinois counties including Cook County (Chicago). Interpretation of reported participation rates requires consideration of the varying practices carriers used in deleting eligible chiropractors from the denominator who were not submitting bills for Medicare beneficiaries even though they had valid Medicare provider numbers (UPINs). Non-participating chiropractors included those who chose not to participate because they preferred to bill patients directly or to bill secondary payers and others who focused their practices on workers’ compensation or sports injury patients. The relatively low participation rates raise important questions about how representative demonstration participants were of all chiropractors and, hence, about the potential cost impacts of expanded coverage if it were to be extended nationally.

Table 2.1: Chiropractors' Participation in the Demonstration *

Demonstration Region	Time Period	Number Participating Chiropractors	Total Number of Medicare Chiropractors		Participation Rate
Northern Illinois and Chicago	Apr-05	1,028	2,631		39%
	Apr-06	1,222	2,689		45%
	Mar-07	1,146	2,296	**	51%
Scott County, IA	Apr-05	63	132		48%
	Apr-06	59	132		45%
	Mar-07	45	132		34%
Central Virginia	Apr-05	47	133		35%
	Apr-06	61	133		46%
	Mar-07	49	133		37%
Maine	Apr-05	162	296		55%
	Apr-06	167	296		56%
	Mar-07	164	296		55%
New Mexico	Apr-05	149	344		43%
	Apr-06	132	340		39%
	Mar-07	126	349		36%

* Chiropractor participation rates were those on the indicated dates and do not record the full range of participation over the course of the demonstration.

** The total number of chiropractors was adjusted in Illinois in October 2006 to delete chiropractors who had not billed Medicare within the previous 12 months.

Interviews with chiropractors identified several factors that influenced decisions not to participate in the demonstration. These included:

- 1) the complexity of billing and high denial rates;
- 2) relatively low Medicare reimbursement rates compared to rates paid by other insurers or fees collected directly from patients;
- 3) concerns about increasing the risk of Medicare probes or audits of their practices; and
- 4) application of the "incident to" rule described previously

The most important reasons they gave for decisions to participate were the encouragement they had received from state chiropractic associations and individual chiropractor's commitments to enhancing the status of their profession. Chiropractors argued that they should be reimbursed for the full range of services they are trained and licensed to perform, the same as medical physicians are.

Billing Complexity and Claims Denials: The complexity of billing procedures under the demonstration was a major challenge for chiropractors' offices. One problem was Medicare's requirement to submit two

separate bills: one for standard chiropractic services and the other for expanded coverage services. The demonstration's code '45' had to be inserted in the proper field on each expanded service claim for it to be considered for reimbursement. Solo or small group practices usually did their own billing manually or electronically. For them, the added burden of submitting two claims per patient visit fell directly on existing staff. Larger practices that used billing warehouses or vendors experienced delays in submitting bills and high error rates early in the demonstration because of vendors' delays in updating their billing software. The relatively small numbers of chiropractor practices and the limited duration of the demonstration provided few incentives for vendors to make updating of their software a high priority. Some chiropractors indicated that the complexity of billing under the demonstration substantially increased office expenses.

Denial rates ranged from as high as 63 percent to as low as 25 percent in different demonstration regions during the early months of the demonstration. Denials imposed burdens on practices and could result in long delays in obtaining reimbursement. With increasing experience, denial rates fell to the 10 to 32 percent range. High initial denial rates reflected, in significant measure, the learning curves of small providers and vendors. Frequent reasons for denials are listed in **Table 2.2**. These reasons centered on questions about patient or provider eligibility for coverage, errors in completing the claim form, incorrect procedure codes or modifiers, failures to meet "medical necessity" requirements, and exceeding the total Medicare limit of \$1,700 per 12-month period for PT services - regardless of whether they were provided by a physical therapist or a chiropractor. "Medical necessity" refers to the acute care requirement that chiropractic services must meet to be reimbursed by Medicare. Maintenance care and preventive care were not eligible for reimbursement.

Table 2.2: Frequent Reasons for Denials Reported by Carriers

Reasons for Denials
Duplicate claims submitted for a service
Claim not covered because not deemed "medically necessary"
Benefit maximum for time period exceeded (applies to the Medicare limit for PT services)
Claim lacked information needed for adjudication
Procedure code inconsistent with modifier or modifier missing
Service or procedure not paid separately (i.e. is bundled)
Service or procedure not covered
Diagnosis not consistent with service or procedure
Provider not eligible to order service or missing identifier information
Patient not identified as a Medicare beneficiary

Denial rates were calculated monthly by Medicare carriers by dividing the number of denied claims for expanded services under the demonstration by the number of billed claims and were adjusted retroactively to the date of the service as denied bills were resubmitted and eventually approved. Without this adjustment, ultimate denial rates would have been overestimated. This procedure makes sense from a carrier's point of view, but does not reflect the efforts required by providers to process denied claims. For example, a claim denied twice in June and July but then approved in August would ultimately be reported as paid in June and removed from denial statistics. In the meantime, the chiropractor would have submitted the claim multiple times and experienced multiple denials. Denial rates shown in demonstration statistics, therefore, may underestimate the amount of effort and frustration chiropractor's offices experienced in understanding the demonstration's requirements and then correcting errors of omission or commission that were made.

Effects on the Demonstration on Patient Volumes and Patterns of Care in Chiropractic Practices:

Chiropractors who were interviewed consistently stated that participation in the demonstration had little effect on the numbers of Medicare beneficiaries they served, on the types of clinical problems treated, or on the frequency of PT services actually provided to patients. They also claimed that expanded coverage had little, if any, effect on total practice incomes. On average, Medicare beneficiaries comprised about 15 percent of practice volumes, with reported ranges of from as low as 10 percent to as high as 60 percent in one practice in the Chicago, Illinois area. Numbers of Medicare patients did not increase during the demonstration in most practices. Exceptions were two chiropractors who practiced in rural areas of New Mexico who indicated that expanded Medicare coverage had lowered barriers to seeking care, especially for poor elderly patients. Low reported effects on participating chiropractors' practice volumes may reflect the fact that the demonstration was not widely advertised.

Chiropractors emphasized that the main effect of the demonstration was to shift responsibility for payment from the patient to Medicare. Otherwise, chiropractors' practice patterns appear to have been little affected. The most frequent services billed under the demonstration are listed in **Table 2.3**. These were extraspinal manipulation, a range of PT services, spinal and cervical x-rays, and E & M visits

Table 2.3: Frequent Services Billed under Expanded Coverage during the Demonstration

Services Billed
1. Extrapinial manipulation (CPT code 98943)
2. PT procedures
Unattended electrostimulation
Electrostimulation, constant attention
Therapeutic exercise
Mechanical traction
Manual therapy techniques
Ultrasound
Neuromuscular reduction
Therapeutic activities to improve functional performance
Massage
Infrared
3. Evaluation and Management (E&M) visits - in new or established patients
4. X-rays
Lumbosacral spine
Cervical spine

The actual frequencies of different types of services varied from region to region, but relative magnitudes were similar according to the quarterly and annual reports submitted by carriers. For example, data from Scott County, Iowa indicated that PT services accounted for 45 percent of expanded coverage services, extrapinial manipulation for 30 percent, and E& M services and x-rays for most of the remainder. MRIs and CT scans were infrequent but may be important because of their high unit costs. From chiropractors' perspectives, one of the most important benefits of the demonstration was that chiropractors could now order MRIs, CT scans, and complex x-rays directly rather than having to refer the patient to a medical physician to order them. Benefits were reduced burdens on patients by avoiding the need for multiple medical appointments and improved continuity of care.

Effects on Practice Costs and Chiropractor Income: Chiropractors indicated that complex billing under the demonstration increased practice expenses and that, at best, participation was a breakeven proposition and "not a profitable business decision". Increased practice expenses resulted from the need to buy new computer systems and software for processing bills; increased staff time to create two bills for each patient visit; high claims' denial rates; and the additional time required to attend educational sessions about the demonstration conducted by Medicare carriers and chiropractic associations. The evaluator did not have access to the practice-level expense or income data that would have been needed to perform a thorough financial analysis.

Summary of Chiropractors' Impressions of the Demonstration:

- Chiropractors were asked for their overall impressions of the demonstration and their recommendations for the future. Responses were consistent from one chiropractor to another and among demonstration regions. In summary, chiropractors' stated that:
- Patients benefited from reduced out-of-pocket costs allowed by expanded coverage of services.
- Better continuity of care and better patient compliance resulted because chiropractors were able to order tests such as MRIs, CT scans, or complex x-rays directly rather than to be required to refer patients to other physicians to obtain them.
- The broad range of diagnoses covered under the demonstration led to more referrals to chiropractors from primary care physicians and orthopedists (e.g.) for treatment of knee or shoulder symptoms.
- The demonstration was more difficult to implement in rural than in urban areas both because training sessions were more difficult for chiropractors to attend and because of the greater distances patients had to travel for services.
- The two-year duration of the demonstration was insufficient to identify potential cost offsets from increased chiropractic care.
- If a national program of expanded coverage for all Medicare beneficiaries were approved, careful preparation would be very important so that billing procedures could be simplified and both chiropractors and Medicare carriers could be adequately prepared.
- The "incident to" rule should be reexamined with attention both to the training and certification of CAs and implications for patient safety.

E. Summary of Findings

1. Main Issues during Demonstration Implementation

- The timetable for implementation was tight; ramp-up was slow; and the learning curve was steep for all involved.
- The billing system was complex and provided difficult challenges both for carriers to implement and for chiropractors to use.
- Use of the "incident to" rule was an impediment to chiropractor's participation because it prevented them from following their usual practice of delegating performance of PT services to their CAs.
- In the absence of public announcements about the demonstration, word was spread to chiropractors by their state associations and by Medicare Part B carriers and to Medicare beneficiaries through chiropractors' offices.
- Chiropractors indicated that their main reasons for participating in the demonstration were to reduce the burdens of payment on patients and to help their profession by advocating for

- Chiropractor participation ranged widely, from 31 percent to 58 percent, in different demonstration regions.
- Denial rates of chiropractor-submitted claims were high early in the demonstration (25 to 63 percent in different regions) but fell to the 10 to 32 percent range by its end.

2. Effects of the Demonstration

- The main effect was to shift payment for expanded chiropractic services from other insurers or patients paying out-of-pocket to Medicare.
- According to chiropractors, patterns of patient care changed little.
- Chiropractors indicated that the demonstration had minimal effects on patient volumes or net practice incomes.
- Increases in Medicare-paid claims were primarily for PT services, extraspinal manipulation, E&M services, and spinal x-rays.
- An important benefit of expanded coverage from the chiropractor's perspective was improved continuity of patient care due to their ability to order x-rays, CT scans, and MRIs, and directly rather than to have to refer patients to medical physicians to obtain them.

3. Strengths and Limitations of this Evaluation of Demonstration Implementation

Strengths

The strengths of this evaluation lie in its involvement of all the major players who participated in designing, implementing, and conducting the demonstration and in its systematic approaches to interviewing them and analyzing available written progress reports and carriers' data on participation and claims activities. Interviews with CMS's Division of Health Promotion and Disease Prevention Demonstrations, the ACA, chiropractic associations and practicing chiropractors, and Medicare carriers provided complementary perspectives that were invaluable to obtaining a thorough and balanced understanding of the demonstration.

Limitations

The main limitations were its largely qualitative nature and its heavy reliance on interviews as data sources. Interviewed chiropractors were self-selected and, almost certainly, not representative of all chiropractors; most were active participants in state chiropractic associations. Though discussions with them were structured and systematic, most responses were subjective in nature. Carrier representatives varied in their abilities to provide explicit information about their involvements in the demonstration and their findings. The most objective data sources were carriers' data on claims activities and their quarterly reports of activities to CMS. However, the validity of comparisons among demonstration regions using these data is limited by apparent variations in accounting practices and data accuracy.

III. SURVEY OF MEDICARE BENEFICIARY USERS OF CHIROPRACTIC SERVICES

A. Overview

This survey of the users of chiropractic services was directed at Medicare beneficiaries who lived in one of the demonstration areas and received either traditional or expanded chiropractic services during the first six months of the demonstration. Its objectives were to document the types of health problems be treated by chiropractors, responses to treatment, satisfaction with chiropractic care; and insurance coverage and the out-of-pocket costs of care. Three groups of beneficiaries were compared: (1) those who received expanded chiropractic services from chiropractors who were participating in the demonstration (ExpP); (2) those who received expanded chiropractic services from chiropractors who were not participating and, hence had to pay out-pocket for these services or have them covered by other health insurance (ExpNP), and those received only standard chiropractic services (StdS).

The objectives were to compare these three groups with respect to:

- demographic characteristics and types of health problems;
- severity of symptoms for which they were receiving chiropractic care;
- types of services they received previously for the same clinical problems from other health professionals and the perceived effectiveness of these services;
- perceived relief from symptoms or disabilities from chiropractic services;
- satisfaction with chiropractic services;
- insurance coverage for chiropractic services in addition to Medicare Part B; and
- out-of-pocket expenses for chiropractic services during the demonstration.

B. Survey Design

1. Survey Methods

The survey was conducted by mail with telephone interview follow-up of non-respondents between April and July 2006 during the second year of the demonstration. All surveys were performed by the Survey Operations Unit of Battelle's Centers for Public Health Research and Evaluation. First, a letter on CMS letterhead was sent to randomly sampled Medicare beneficiaries explaining the survey and encouraging their participation. A pre-stamped and self-addressed postcard was enclosed that recipients were asked to return if they preferred not to participate. A telephone contact number was provided for those who had questions. The survey instrument was mailed two weeks later if no response had been received. Two reminders were sent at two week intervals if the completed questionnaire had not been received. The mailed survey package included a cover letter emphasizing the importance of the survey, a bar-coded questionnaire, and a postage-paid return envelope. All documents were available in English and Spanish. A \$10 money order was mailed to the respondent when a completed mailed questionnaire had been received or a telephone questionnaire had been administered. The written survey took 10-12 minutes to

complete, and telephone administration took less than 20 minutes. The survey was approved by CMS' Privacy Board, the Office of Management and Budget (OMB), and by the Institutional Review Boards of Brandeis University and the Battelle Institute. A copy of the survey instrument is provided in **Appendix E**.

2. Survey Sample

Random samples of beneficiaries were selected in each demonstration area using Medicare claims data to identify those who had received chiropractic services during the first 6 months of the demonstration (April 1 through September 30, 2005). Within each demonstration area, three distinct samples were identified: (1) users of chiropractic services for which Medicare coverage is standard policy (StdS); (2) users of expanded services provided by chiropractors who were participating in the demonstration and, therefore, were being reimbursed by Medicare for these services (ExpP); and (3) users of expanded services provided by chiropractors who were billing Medicare for expanded services but were not participating in the demonstration and, hence, were not being reimbursed for these services (ExpNP). Billed services that are not reimbursed by Medicare are provided in claims data files.

Samples sizes and response rates by region and user type are shown in **Table 3.1**. The larger samples in Illinois reflect the much larger number of chiropractic users in this state. The eligible sample included 3,464 individuals of whom 2,457 completed the survey for a corrected response rate of 70.9 percent. Of respondents, 93 percent completed the mailed questionnaire and 7 percent completed telephone surveys. Expanded service users treated by participating chiropractors constituted 48.7 percent of the sample; expanded service users treated by nonparticipating chiropractors 14.8 percent; and standard service users 36.5 percent. Response rates were very similar across states and in these three user groups. Respondents did not differ appreciably from non-respondents in age or gender.

Table 3.1. Number of Sampled Beneficiaries and Respondents in All Four Demonstration Regions By State and User Type

Region	Expanded Service Users (Participating Chiropractors)			Expanded Service Users (Non-participating Chiropractors)			Standard Service Users Only (All Chiropractors)			All		
	Sample	Re- sponse	Rate	Sample	Re- sponse	Rate	Sample	Re- sponse	Rate	Sample	Re- sponse	Rate
Illinois	711	467	65.7	215	151	70.2	418	299	71.5	1,344	917	68.2
Maine	292	208	71.3	47	32	68.1	208	153	73.6	547	393	71.9
New Mexico	310	220	71.0	66	50	76.3	203	144	70.9	579	414	71.6
Virginia	220	168	76.4	106	80	75.7	205	153	74.5	531	401	75.5
Iowa	190	133	69.8	70	50	71.1	203	149	73.3	464	332	71.6
Totals	1,723	1,196	69.4	503.5	363	72.1	1,238	898	72.5	3,464	2,457	70.9

3. Analysis Plan

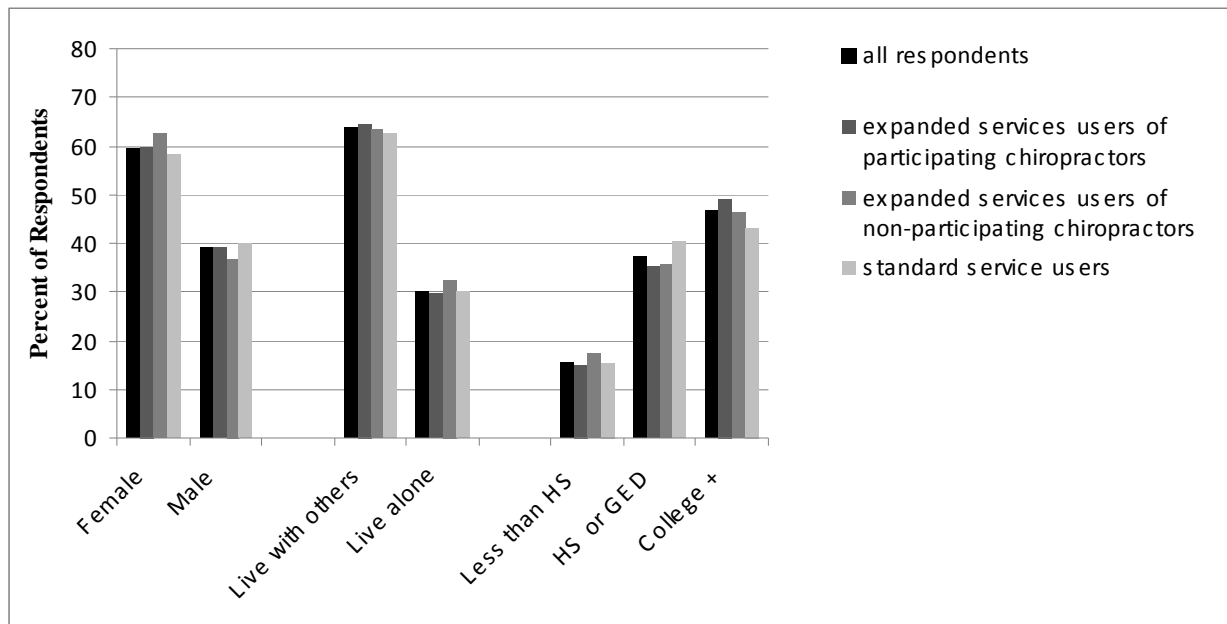
The analysis examined differences between the three groups using t-tests or chi-square tests, as appropriate. Potential non-response bias was examined by comparing the demographic characteristics of survey respondents and non-respondents.

C. Survey Results

1. Demographic Characteristics

Overall, survey respondents were predominantly white (91 percent), female (60 percent), married (60 percent), lived with one or more other people (64 percent), and had at least a high school education (84 percent) (**Figure 3.1**). The largest ethnic minority population was Hispanic (4 percent), followed by black (2 percent) and American Indian (2 percent). Asians made up fewer than one percent of respondents. New Mexico had the largest proportion of Hispanics or Latinos (16 percent). Expanded service users of participating chiropractors (ExpP) were somewhat more likely to have had at least some college education (49 percent) than ExpNP users (46 percent) and StdS users (43 percent) ($p=0.01$ for ExpP vs. StdS; NS for ExpP vs. ExpNP) (**Figure 3.1**).

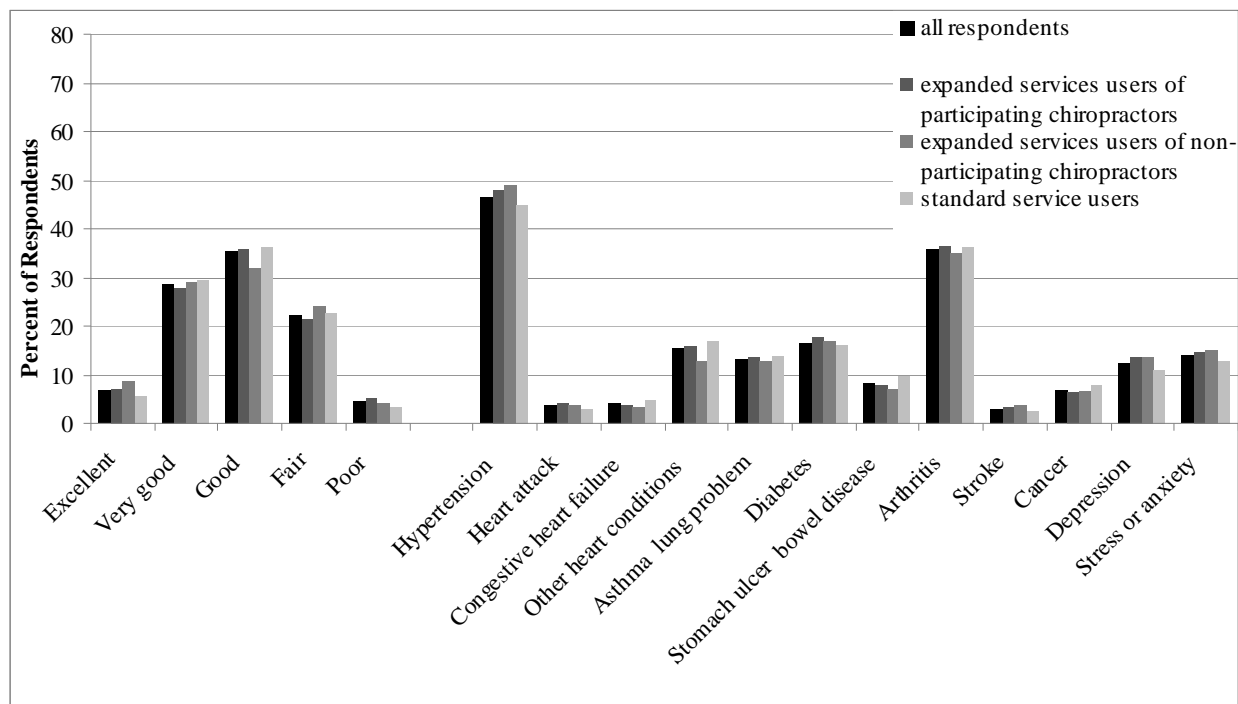
Figure 3.1: Gender, Household Size, and Education of Respondents



2. General Health of Respondents

Beneficiaries were asked to rate their general health and to indicate specific medical problems for which they were currently receiving treatment. The results are summarized in **Figure 3.2**. A large majority indicated that their general health was good to excellent health (72 percent) with only small differences among the three subgroups. Frequent types of medical problems included hypertension (47 percent) and arthritis (36 percent), heart disease (24 percent), diabetes (17 percent), asthma (13 percent), stress or anxiety (13 percent) and depression (12 percent).

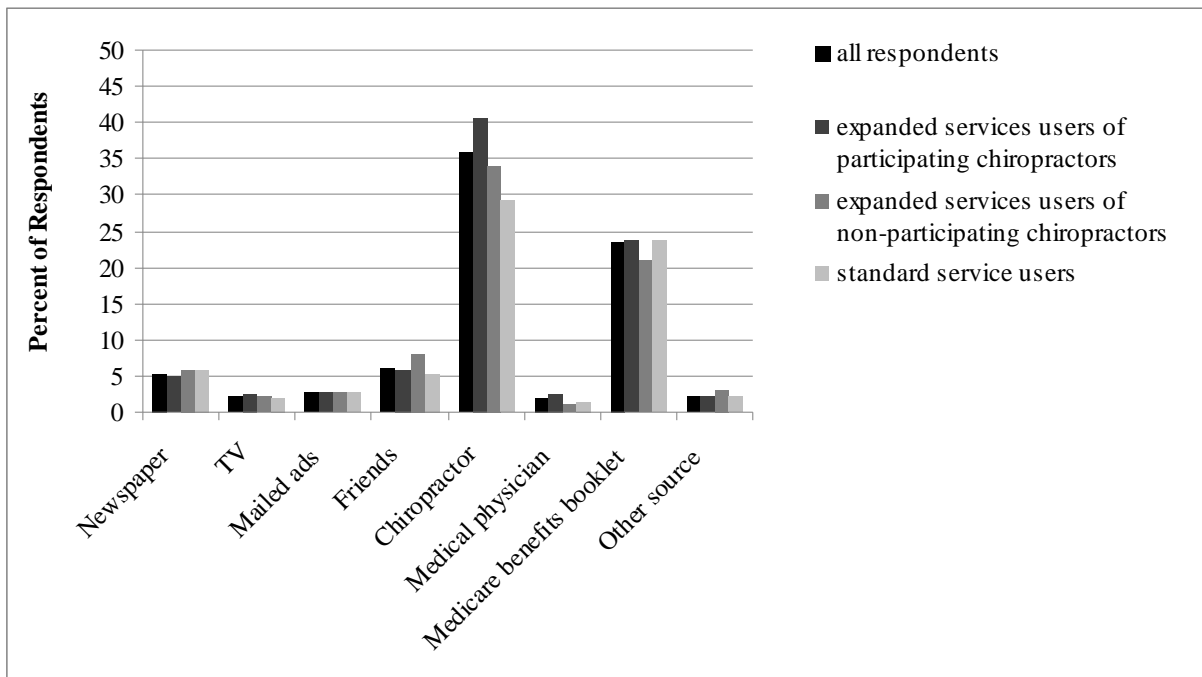
Figure 3.2: Patient-reported General Health and Medical Problems



3. Awareness of the Chiropractic Demonstration

Fewer than half (49 percent) of respondents were aware of Medicare’s demonstration of expanded coverage for chiropractic services, including 53 percent of ExpP users, 48 percent of ExpNP users, and 46 percent of StdS users ($p=0.11$ for ExpP vs. ExpNP and $p=0.003$ for ExpP vs. StdS) (**Figure 3.3**). Of those who were aware, 36 percent learned about it from their chiropractors. Not surprisingly, chiropractors were a more frequent source of information in the ExpP user group than the ExpNP or StdS user groups [41 percent vs. 34 percent ($p = 0.01$) and 29 percent ($p = 0.0001$), respectively]. The second most frequently reported source of information was the Updated Medicare Benefits Booklet (23 percent). Since the Medicare Benefits Booklet did not contain information on the demonstration, respondents may have been referring to informational updates from Medicare or information received from chiropractic associations.

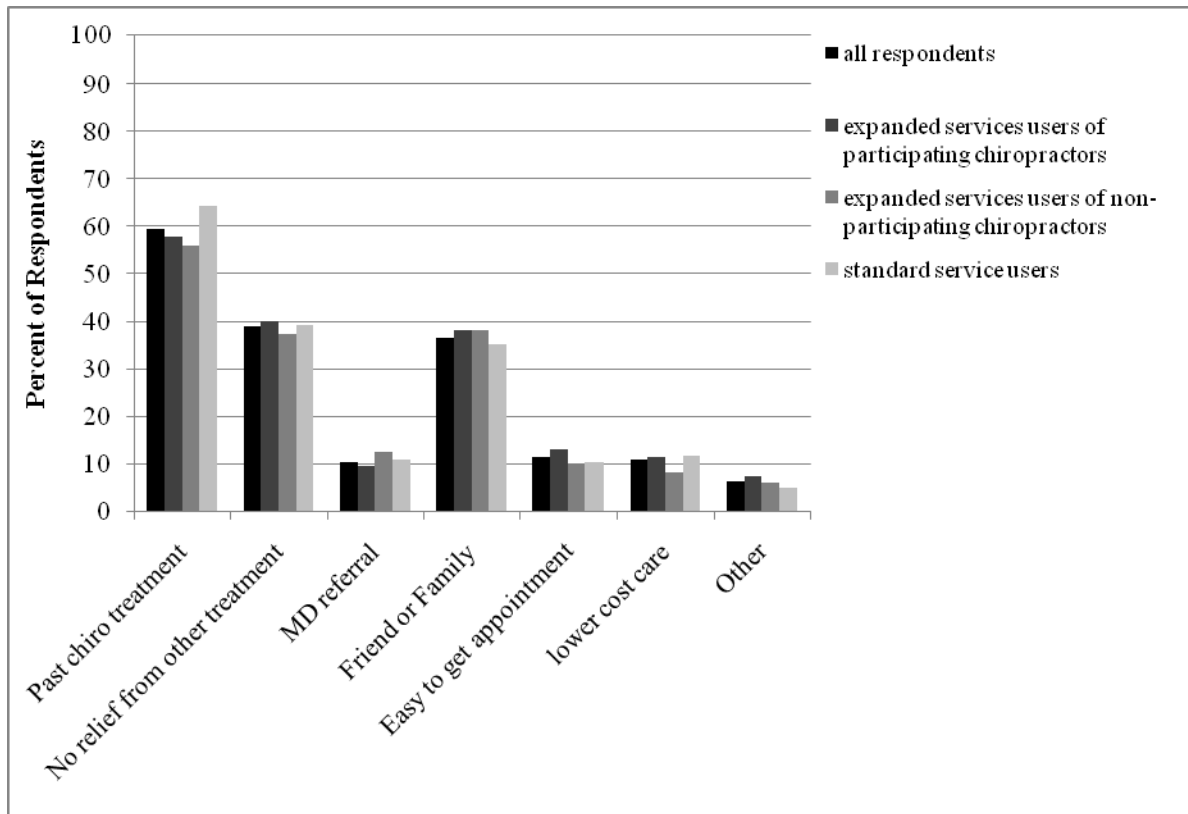
Figure 3.3: Patient-reported Sources of Information about Medicare’s Expanded Coverage for Chiropractic Services.



4. Chiropractic Care: Reasons, Symptoms, Responses, and Benefits

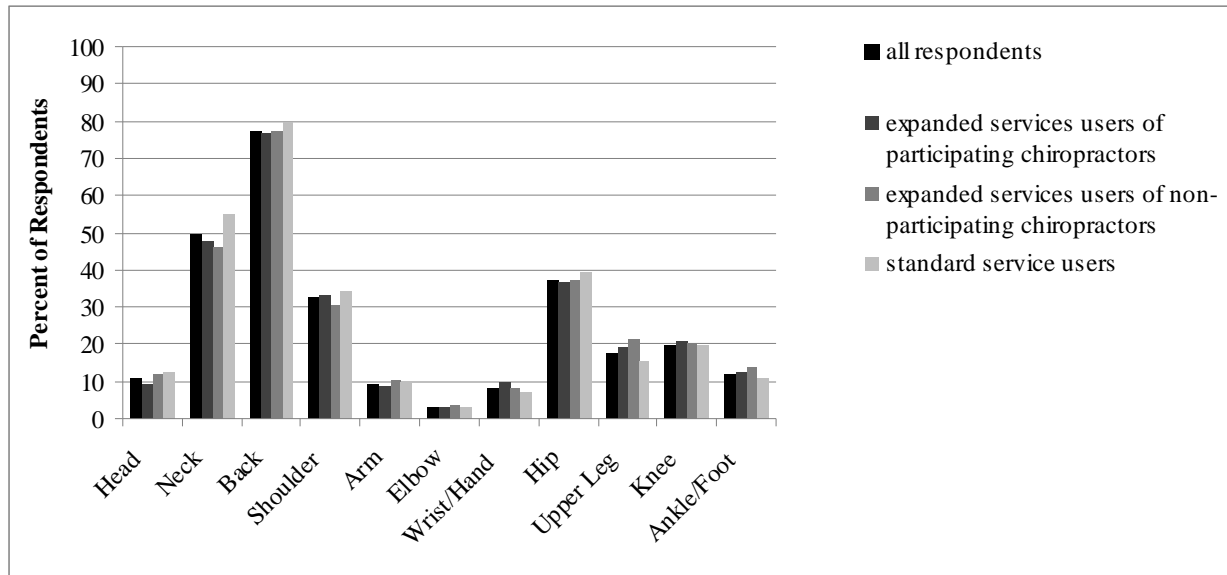
Reasons for Seeking Chiropractic Care: The most frequently given reason given for seeking chiropractic treatment was a previous experience with a chiropractor (59 percent), followed by insufficient relief of symptoms by other health professionals (39 percent), and recommendations by a family member or friend (37 percent). More StdS users reported previous chiropractic treatment as a reason than did ExpP users ($p=.002$) (**Figure 3.4**).

Figure 3.4: Patient-reported Reasons for Seeking Chiropractic Care



Presenting Symptoms and Disabilities: Respondents were asked to indicate the single most important problem or symptom that caused them to seek chiropractic care, but many reported multiple problems. More than half (55 percent) had had their worst problem for more than two years, and 70 percent had had it for more than one year. By far the most frequently affected part of the body was the back (78 percent), followed by the neck (50 percent), hip (38 percent), shoulder (32 percent), and knee (20 percent) (**Figure 3.5**). Most respondents had problems in more than one body area (mean = 2.6). Standard service users had significantly higher frequencies of symptoms in the head ($p < 0.04$) and neck ($p < 0.005$) than did ExpP users, but had a lower frequency of symptoms in the upper leg ($p < 0.04$).

Figure 3.5: Patient-reported Body Parts Affected by the Worst Symptom.



Pain was by far the most frequent symptom (91 percent), followed by stiffness (49 percent), difficulty walking (40 percent), and difficulty with daily tasks (35 percent). Smaller numbers of respondents indicated loss of balance (14 percent) or headache (15 percent). Patient-reported types of symptoms were similar in the three groups (**Figure 3.6**). Overall, symptoms were judged to be “very severe” in 39 percent and “severe” in 27 percent of respondents at the time of first visits to a chiropractor and interfered with usual activities either “quite a bit” or “extremely” in 69 percent. No significant differences were found among the three groups in the proportions of patients with “very severe or severe” symptoms or “extreme or quite a bit” of interference with daily activities (**Figure 3.7**).

Figure 3.6: Patient-reported Types of Symptoms

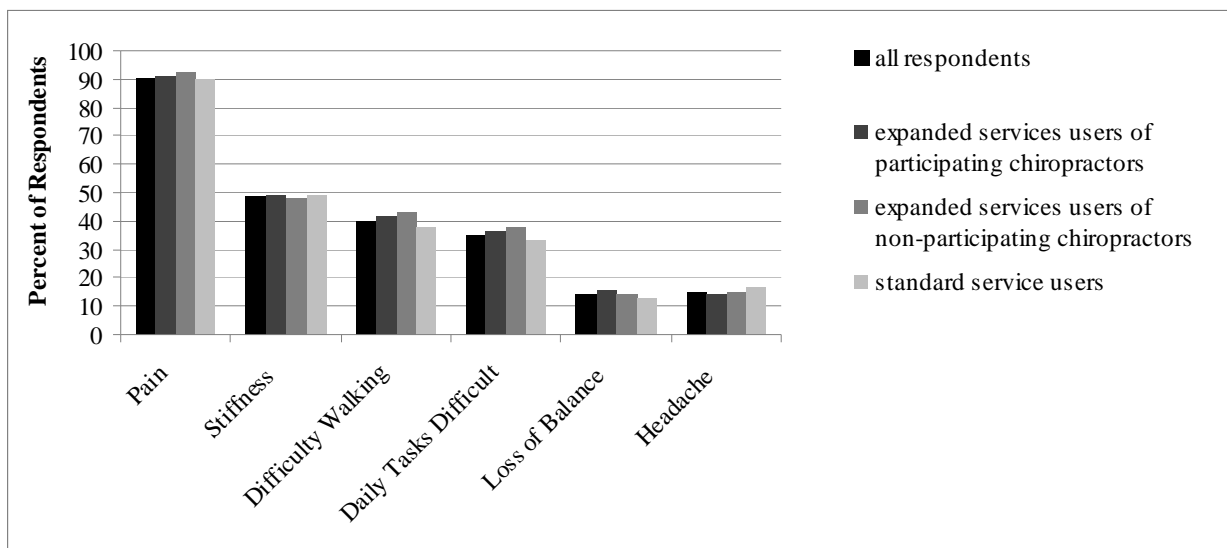
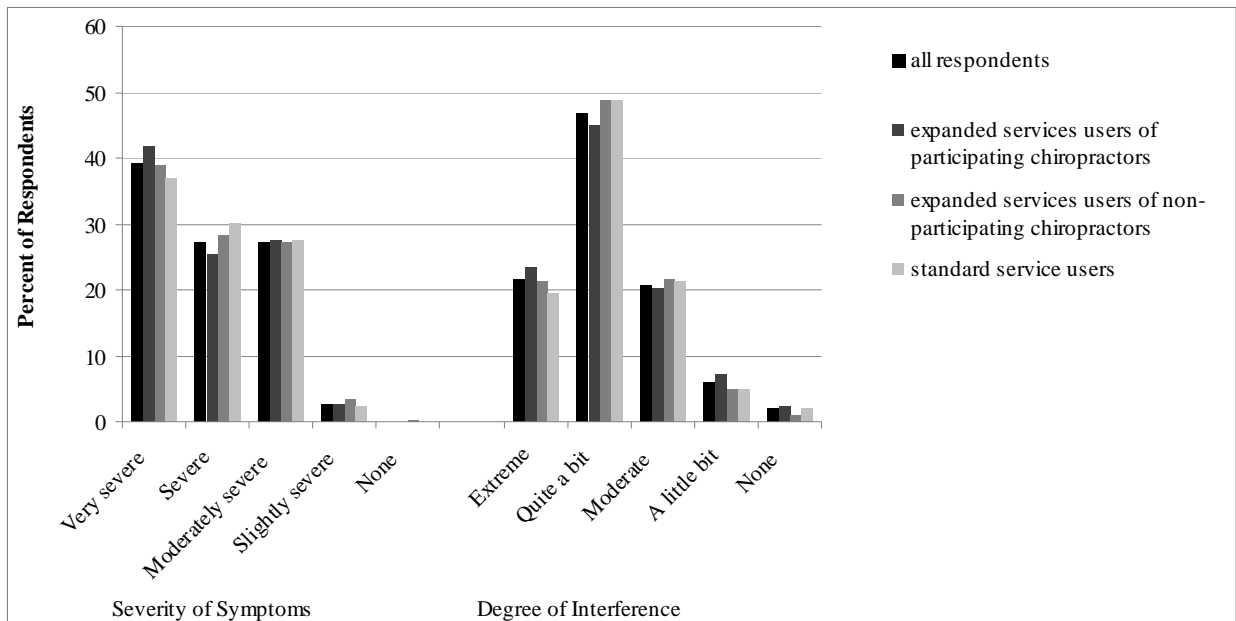
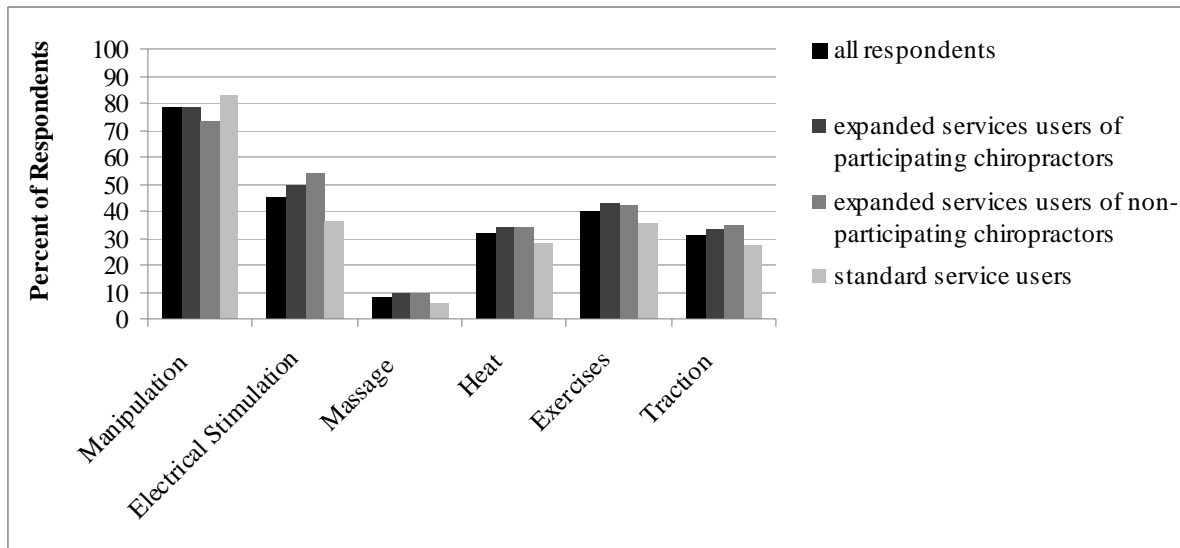


Figure 3.7: Patient-reported Severity of Symptoms and Degree of Interference with Daily Activities at the First Visit to the Chiropractor



Treatments Received from Chiropractors: Manipulation was by far the most frequent type of treatment received (79 percent of patients), followed by electrical stimulation in 45 percent and exercises in 40 percent (**Figure 3.8**). Respondents reported receiving a median of two types of treatment with a range from 1 to 5 or more. Expanded service users (ExpP and ExpNP) received more different types of treatments than did StdS users, with 51 percent compared to 39 percent receiving three or more types of services ($p < 0.0001$) (data not shown). Not surprisingly, StdS users were more likely to receive manipulation than expanded service users ($p=0.01$ vs. ExpP and $p=0.0001$ vs. ExpNP) and were less likely to receive each type of PT services ($p = 0.0001$ for each comparison).

Figure 3.8: Patient-reported Types of Treatments Received from Chiropractors



Symptom Relief: Nearly 60 percent of respondents reported “complete” or “a lot of relief” of symptoms from their chiropractic treatments, and another 28 percent reported moderate relief (**Figure 3.9**). Standard services users were more likely to experience “complete” or “a lot of relief” than expanded services users ($p = 0.003$ vs. ExpP and $p = 0.009$ vs. ExpNP), perhaps because of patient selection effects. Relief from interference with daily activities was impressive (**Figure 3.10**). Following treatment, only 4 percent of all respondents were “extremely” limited and 22 percent were “quite a bit” limited compared to 21 percent and 47 percent, respectively, before treatment (**Figure 3.10 vs. Figure 3.7**).

Figure 3.9: Patient-reported Relief of Symptoms from Chiropractic Treatments

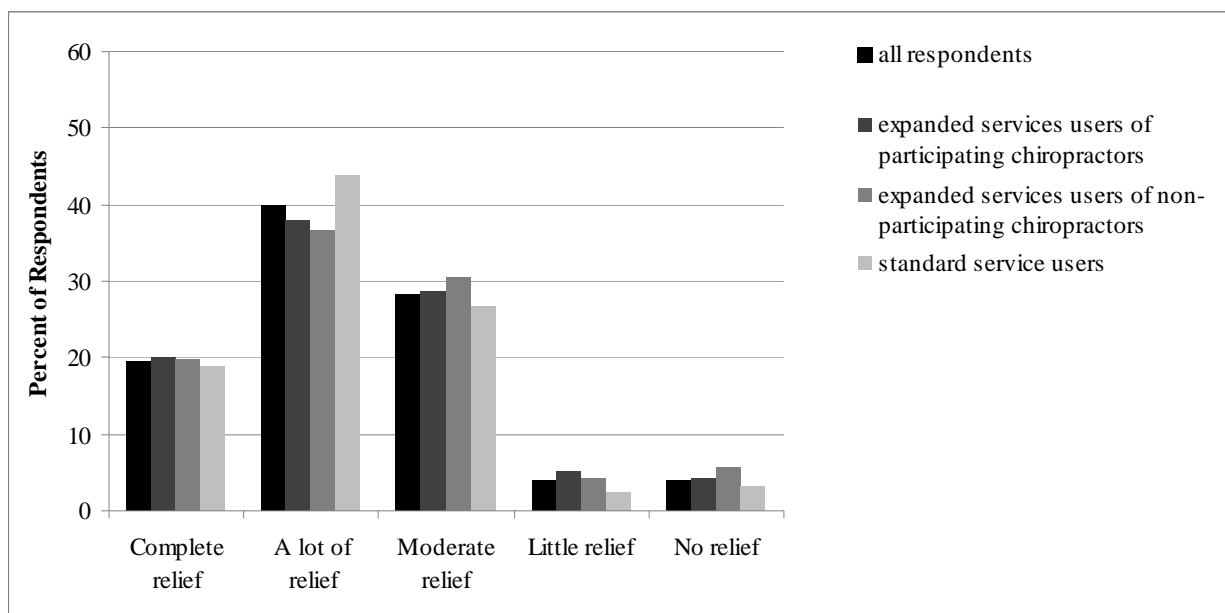
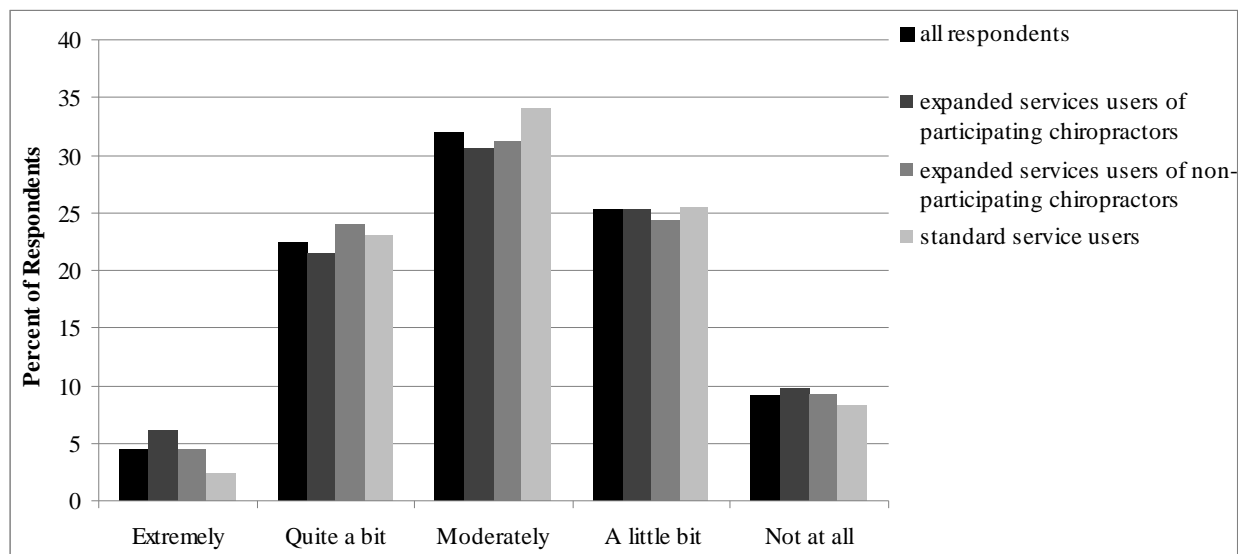


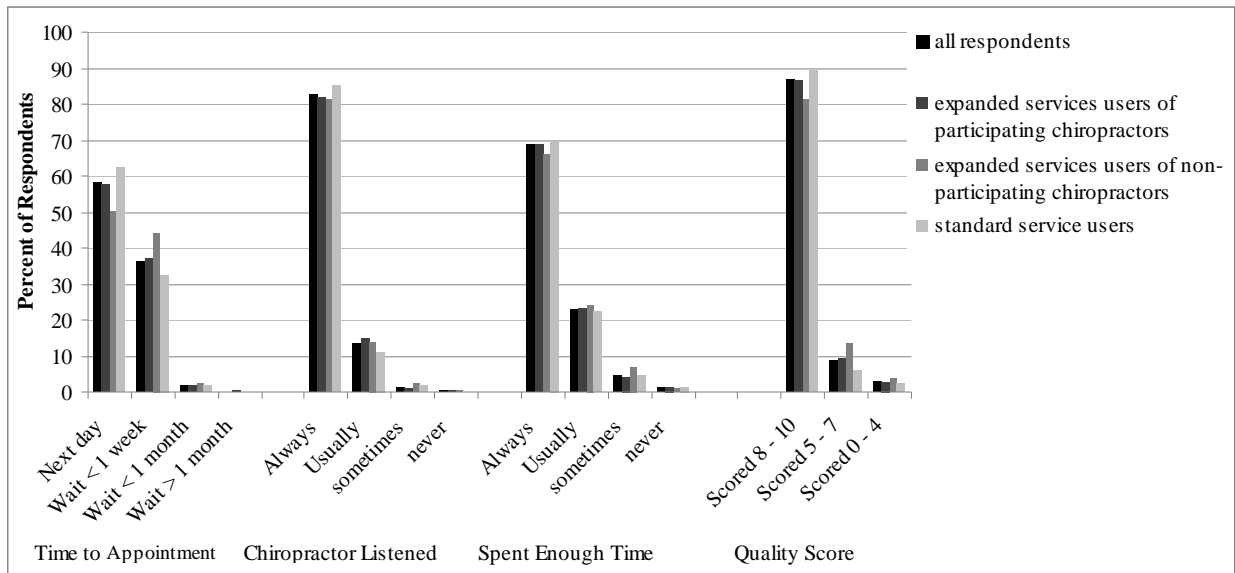
Figure 3.10: Patient-reported Interference of Symptoms with Usual Activities after Treatment



5. Satisfaction with Chiropractic Care

Satisfaction questions focused on how long patients had to wait for a chiropractic visit, how well the chiropractor listened, and whether the chiropractor spent enough time with the patient. The survey also asked respondents to rank their overall satisfaction with care received on a 10-point scale (**Figure 3.11**). Nearly 95 percent of respondents reported that they waited no more than one week to see a chiropractor, and 58 percent indicated they received appointments within one day. Appointments the next day were reported by 62 percent of StdS users, 57 percent of ExpP users, and 50 percent of ExpNP users ($p=0.03$ for StdS vs. ExpP and $p=0.0001$ for StdS vs. ExpNP). Responses to other questions indicated high levels of satisfaction with 96 percent reporting that the chiropractor "usually" or "always" listened carefully and 92 percent indicating that the chiropractor "usually" or "always" spent enough time with them. Overall satisfaction with care was high with 87 percent indicating a score of 8 or higher on a 10-point scale, including 58 percent indicating a score of 10.

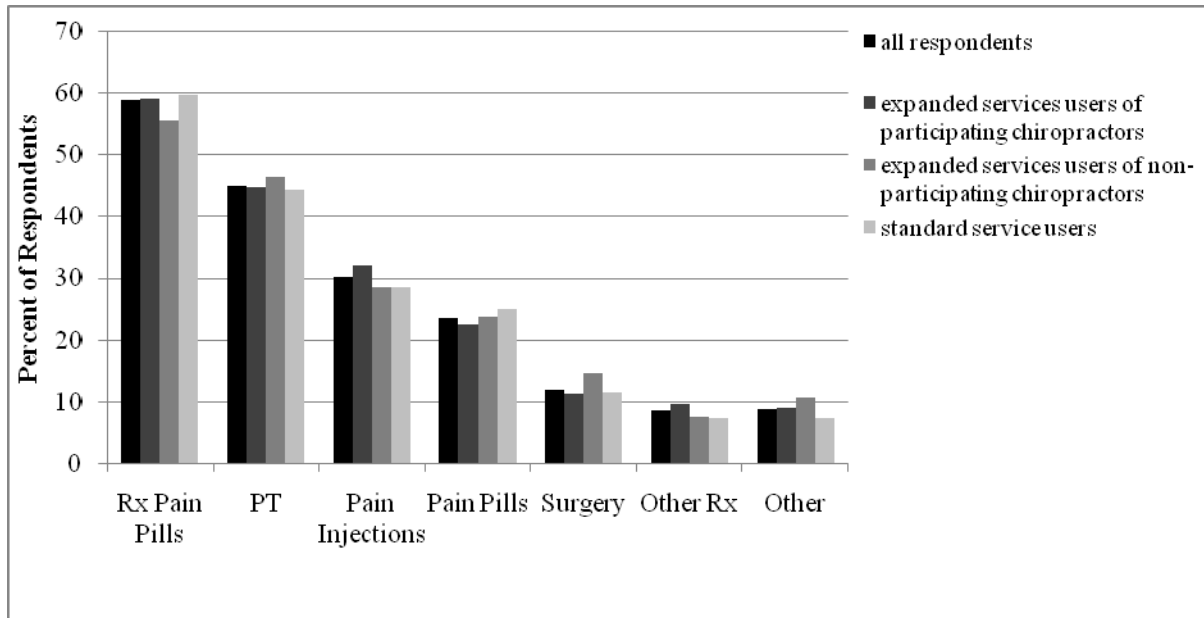
Figure 3.11: Scores on Quality-of-care Indicators for Chiropractic Care



6. Prior Treatments for the Same Problem

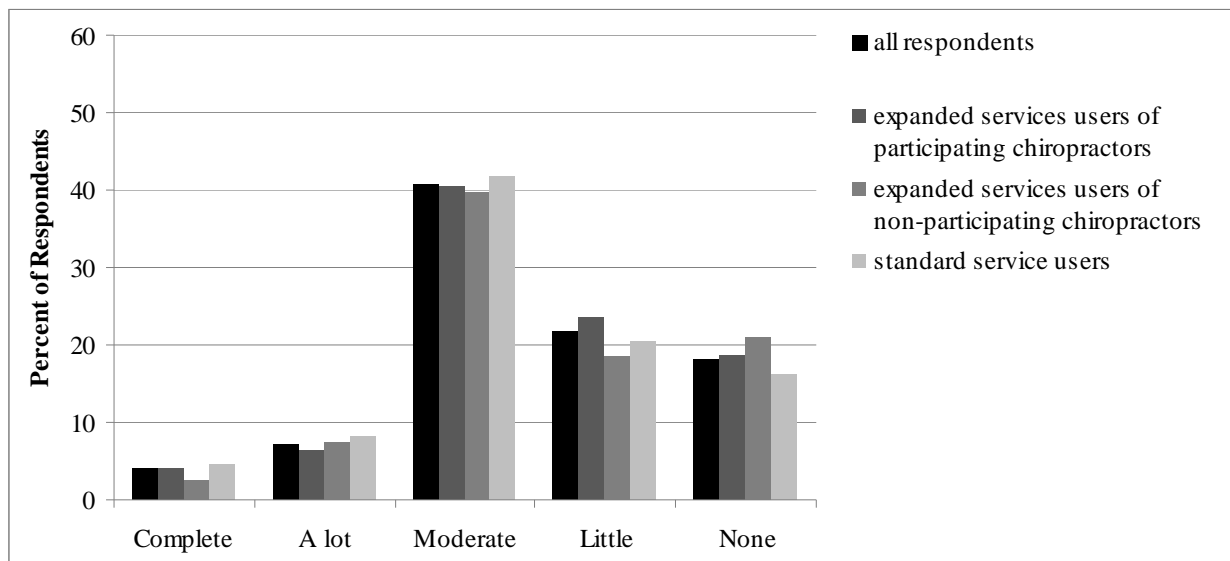
A majority of respondents (60 percent) had been treated for their “worst” problem by other health professionals prior to seeking care from a chiropractor, and many (20 percent) were still receiving treatment from them. Types of treatments received from other providers included prescriptions for pain pills (58 percent), injections for pain (30 percent), both pills and injections for pain (22 percent), PT procedures (45 percent), and surgery in 12 percent (**Figure 3.12**). On average, other health professionals gave fewer types of treatment than chiropractors (73 vs. 54 percent, $p = 0.0001$).

Figure 3.12: Patient-reported Types of Treatments Received from Other Health Care Professionals



The degree of symptom relief obtained from previous treatments by other health professionals was reported as being significantly less than that from chiropractic treatment, with only 11 percent of patients reporting a lot or complete relief from their worst problem (**Figure 3.13**) compared with 60 percent in patients receiving chiropractic care (**Figure 3.9**). These results must be interpreted with caution, however, because patients whose symptoms were not relieved by previous treatments would be more likely to seek care from chiropractors.

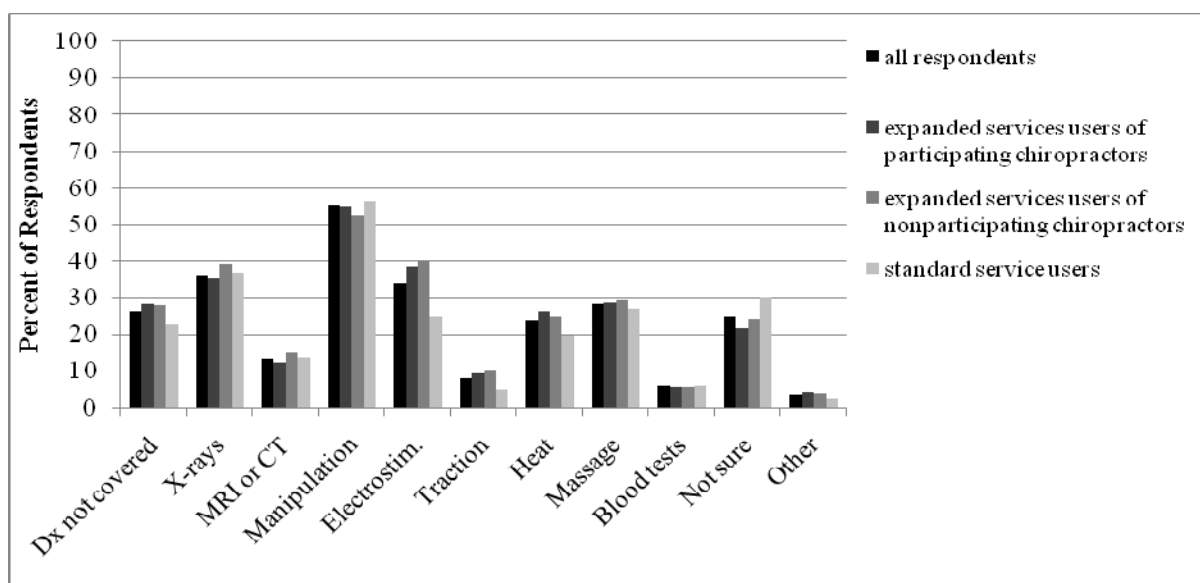
Figure 3.13: Patient-reported Degree of Symptom Relief Obtained from Other Health Professionals



7. Health Insurance Coverage

Most respondents (69 percent) had some type of health insurance that covered chiropractic services in addition to Medicare (data not shown) including private insurance in 32 percent, Blue Cross/Blue Shield in 30 percent, Medicaid in 5 percent, and the Veteran’s Administration in 1 percent. Medicare coverage was felt to be particularly important for manipulation but was also important for x-rays, electrical stimulation, massage, and heat treatments (**Figure 3.14**). Not surprisingly, these are also the most frequent services provided by chiropractors.

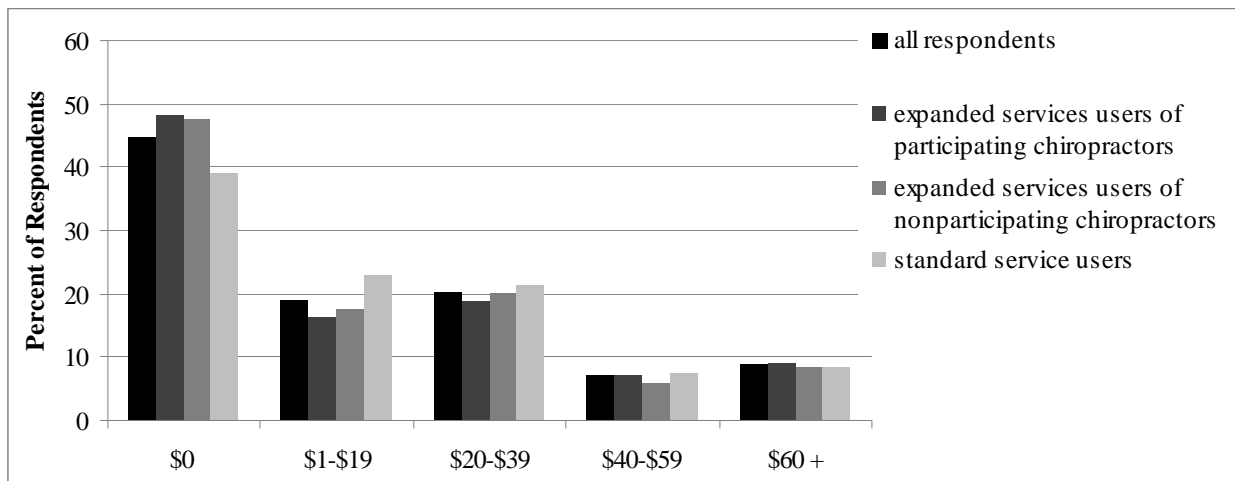
Figure 3.14: Chiropractic Services for which Increased Medicare Coverage is Especially Important



8. Out-of-pocket Costs

Out-of-pocket costs paid by beneficiaries for chiropractic services during the demonstration were assessed by asking them to indicate the average out-of-pocket cost for a chiropractic visit during the preceding 12 months. Responses were grouped into dollar ranges, with zero out-of-pocket cost as a separate category (**Figure 3.15**). A higher proportion of ExpP users reported zero out-of-pocket costs than StdS ($p = 0.0002$), but there was no significant difference between ExpP and ExpNP. Mean out-of-pocket costs were lower in both groups of expanded service users than standard service users [\$29 for ExpP vs. \$28 for ExpNP (NS) vs. \$34 for StdS ($p = 0.001$)].

Figure 3.15: Patient-reported Out-of-pocket Expenses



D. Summary and Discussion

1. Summary of Findings

Survey Population: This survey of chiropractic service users was conducted in a randomly selected sample of 3,464 Medicare beneficiaries with an overall response rate of 71 percent. Of respondents, 49 percent were receiving expanded services from chiropractors who were participating in the demonstration (ExpP); 15 percent were receiving expanded services from non-participating chiropractors (ExpNP); and 36 percent were receiving only standard chiropractic services (StdS). Demographic characteristics of the three groups were similar except that ExpP users were somewhat more likely to have had some college education. Most respondents (71 percent) reported good or excellent general health. Hypertension and arthritis were the most frequent comorbidities. Only half of respondents were aware of Medicare’s expanded coverage demonstration, including only 53 percent of ExpP users

Reasons for Seeking Care and Care Received: The most frequent reasons for seeking chiropractic care were previous experiences with a chiropractor (59 percent) and insufficient relief from prior treatment by other health professionals (39 percent). Presenting 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, and symptoms were graded as severe or very severe by 65 percent of respondents. These symptoms interfered “considerably” with usual activities in 69 percent. Manipulation was the most frequent treatment received from the chiropractor (79 percent), followed by various types of PT procedures.

Benefits of Treatment and Satisfaction with Care Received: Nearly 60 percent of respondents received “complete” or “a lot” of symptom relief. Satisfaction with care from the chiropractors was high,

with 87 percent indicating levels of satisfaction of 8 or higher on a 10 point scale and 58 percent indicating a perfect 10. Nearly 95 percent of respondents waited no more than one week for an appointment with a chiropractor, and similar proportions indicated high levels of satisfaction in terms of the chiropractor listening carefully to them and spending enough time with them. No important differences were found between the three user groups on any of these measures.

Prior Treatments by Other Health Professionals: The treatments received from other health professionals prior to their seeking chiropractic care differed strikingly from those provided by chiropractors. Prior therapy included pain pills in 59 percent, pain injections in 30 percent, both pain pills and injections in 22 percent, PT in 45 percent, and surgery in 12 percent. Complete or a lot of symptom relief was reported by 59 percent beneficiaries as a result of chiropractic treatments.

Financial Considerations: A high proportion of respondents (69 percent) reported that they had health insurance coverage for chiropractic services in addition to Medicare Part B. Zero out-of-pocket costs for visits were reported by nearly half of expanded chiropractic service users compared with 39 percent of standard service users.

2. Limitations of the Survey

The main limitations were: (1) potential non-response biases in patients who were dissatisfied with services or marginally interested in their chiropractic care ('casual users'); (2) the subjective nature of responses required by some questions; and (3) potential inaccuracies in responses to other questions. Though questions on the benefits of treatment and on satisfaction with care were subjective, they represented valid opinions at the time the survey was completed. Finally, respondents may have had trouble recalling or estimating average out-of-pocket costs for a chiropractor visit, and nearly 20 percent did not answer this question. As a result, inaccuracies of responses and potential response biases may have influenced results.

IV. EFFECTS OF THE DEMONSTRATION ON THE UTILIZATION AND COSTS OF CHIROPRACTIC SERVICES

A. Overview and Objectives

1. Overview

Medicare claims data were used to assess the effects of the demonstration's expanded coverage for chiropractic services on the utilization of services and on Medicare reimbursements in beneficiaries with NMS diagnoses. Analyses compare results for beneficiaries in demonstration regions with those in matched comparison counties selected on the basis of demographic factors and health care cost and utilization characteristics and matched two-to-one to specific demonstration counties.

The analyses estimate the impact of the demonstration on three beneficiary groups: all of those who were eligible for chiropractic services because of qualifying NMS diagnoses; those who used any chiropractic service; and those who used expanded chiropractic services. Overall, analyses provide a comprehensive view of the utilization and reimbursement impacts of the demonstration. Subgroup analyses show effects on diagnostic subgroups of beneficiaries and compare impacts on urban or rural and HPSA or non-HPSA regions within demonstration areas.

The period of observation in this report includes six consecutive six-month intervals: two before the demonstration began to provide baseline measures and four during the demonstration. Analyses use difference-in-difference statistics to compare trends in utilization and reimbursements in demonstration and comparison counties. Hence, the average effect of the demonstration is measured after controlling for factors that may have affected Medicare utilization and payments more generally. This approach controlled results for important threats to validity that would have arisen if analyses were based only on data from the demonstration regions.

2. Goals and Objectives

The overall goal was to examine the effects of the demonstration in three nested groups of beneficiaries: (1) those who were eligible for expanded chiropractic coverage because they had a qualifying NMS diagnosis, (2) users of any chiropractic service, and (3) users of expanded chiropractic services (most of whom also used standard chiropractic services). The analysis focused on ambulatory services covered under Medicare Part B including standard chiropractic services, expanded chiropractic services, and other NMS-related services. The analysis included data for the full two-year period of the demonstration.

Specific research questions examined include:

- 1) Did expanded coverage increase the number of beneficiaries who received any chiropractic services?

- 2) Did expanded coverage increase the number of beneficiaries who received expanded chiropractic services?²
- 3) Did expanded coverage increase utilization of standard chiropractic services per user?
- 4) Did expanded coverage increase Medicare reimbursements for chiropractic services per user?
- 5) Did expanded coverage increase total Medicare reimbursements for chiropractic services?
- 6) Did expanded coverage of chiropractic services result in changes (decreases or increases) in the use of non-chiropractic ambulatory services for NMS diagnoses?
- 7) Did claims' denial rates for chiropractic services under the demonstration change over its course?

B. Analytic Methods

1. Data Sources

The claims data used in these analyses were drawn from the CMS Data Center using DESY, CMS's data extraction system, and are based on claims from Part B physician/supplier data files covering the time period April 1, 2004 (one year before the demonstration began) through March 31, 2007. Claims were divided into six-month time periods to allow for equivalent comparisons controlling for seasonal effects and to examine trends as the demonstration progressed. The first two six-month time periods provide pre-demonstration data, and the last four time periods provide data during the demonstration.

Pre-Demonstration Periods

Summer '04: April 1, 2004 to September 30, 2004

Winter '04 -'05: October 1, 2004 to March 31, 2005

Demonstration Periods

Summer '05: April 1, 2005 to September 30, 2005

Winter '05 -'06: October 1, 2005 to March 31, 2006

Summer '06: April 1, 2006 to September 30, 2006

Winter '06-'07: October 1, 2006 to March 31, 2007

2. Matched Comparison Counties

A multi-step process was used to identify non-participating counties that matched demonstration counties on key variables associated with chiropractic service utilization and reimbursement. As a first step, correlation analysis was used to identify county level characteristics that significantly correlated with the volume and cost of Medicare chiropractic service use. These variables included overall Medicare reimbursements per beneficiary, urban/rural status, HPSA/non-HPSA status, and measures of race and

² Many chiropractors billed Medicare for expanded chiropractic services before the demonstration began, even though the claims were denied. Estimation of the effects of the demonstration on utilization of expanded services assumes these denied claims represented actual utilization

socioeconomic status. Second, principal component analysis was applied to this set of variables, combined with chiropractic reimbursement per beneficiary, to construct a one-dimensional factor and summary score for each county. This factor was used to find each demonstration county's closest matches among all candidate counties.³ To assure sufficient sample size, each demonstration county was matched to two comparison counties. Beneficiaries with NMS-related diagnoses from the two comparison counties were combined to form the primary comparison sample. See **Appendix F** for a list of demonstration counties and matched comparison counties.

3. Analytic Approaches

Demonstration effects were estimated from 'difference-in-differences' statistics for chiropractic service user rates, utilization patterns, and reimbursements in demonstration and comparison area beneficiaries during baseline (pre-demonstration) and demonstration time periods. Calculations were made for three nested groups of beneficiaries including those who were eligible for chiropractic services by their NMS diagnoses, users of any chiropractic service, and users of expanded chiropractic services (most of whom also used standard chiropractic services). Three types of services were analyzed, including standard chiropractic, expanded chiropractic, and all other NMS-related Part B services. Six-month intervals were used for the analyses to permit comparisons controlling for possible seasonal influences on the use of chiropractic services and to examine trends in use and reimbursements over time. As described below, a 'chiropractic-eligible' beneficiary is defined as one who had at least one Medicare Part B claim within the study time period with a principal diagnosis of an NMS condition that qualified the person for either standard chiropractic services (i.e. spinal manipulation to correct an acute spinal subluxation) or expanded chiropractic services.⁴

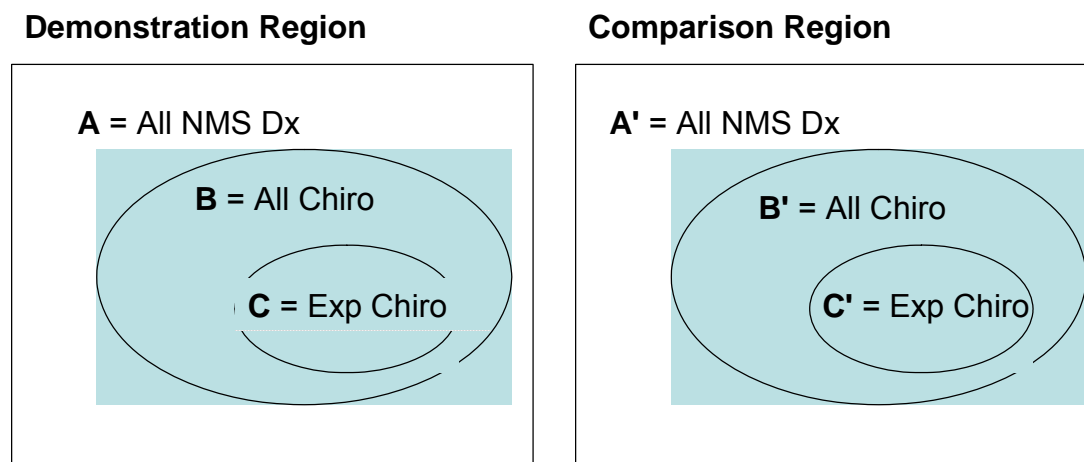
Beneficiary Cohorts Studied: The study sample included all beneficiaries in demonstration and comparison counties who had one or more qualifying NMS diagnoses. These individuals were categorized into the three cohorts depicted in **Figure 4.1**. Here, sets A and A' are beneficiaries with NMS diagnoses; sets B and B' are beneficiaries who used any chiropractic service; and sets C and C' are beneficiaries who used any expanded chiropractic service. For each pair, analyses examined and

³ Counties that bordered demonstration regions were excluded from the analysis in order to reduce bias associated with border-crossing. Specifically, residents of border counties might travel into the demonstration region to take advantage of expanded Medicare covered services. This would affect observed utilization and payment rates for these bordering counties by importing the demonstration effects and thereby reducing the differences between demonstration and comparison counties. In addition, because of differences in carrier-specific reimbursement patterns for chiropractic services, the rule was imposed that comparison counties had to have the same contractor serving as the local Medicare Part B carrier

⁴ The only ICD-9 diagnosis that qualifies a beneficiary for standard chiropractic services is 739 (acute spinal subluxation). However, demonstration beneficiaries in Maine continued to receive reimbursed standard services with claims having diagnoses 839. This is a particularly important example of variations in local carrier reimbursement practices

compared chiropractic utilization and Medicare expenditures per user, by diagnostic class of interest (i.e. spine, extremities, neurological problems, or combinations of these), and by type of geographic area in which they received the service (urban or rural and HPSA or non-HPSA).

Figure 4.1: Cohorts Used for Medicare Utilization and Expenditure Comparisons



A and A' refer to all Medicare beneficiaries with any primary NMS diagnosis;
 B and B' refer to beneficiaries using any service from a chiropractor;
 C and C' refer to beneficiaries using an expanded service from a chiropractor.

Dx = diagnosis

Beneficiaries and Claims Used for the Analysis of Utilization: Evaluation of the effects of the demonstration on the utilization of expanded chiropractic services requires comparison of chiropractic service users in demonstration and comparison areas and the ability to examine changes in utilization over time before and during the demonstration. Although CMS is primarily interested in beneficiaries who received expanded chiropractic services that were reimbursed by Medicare during the demonstration, limiting the analysis to this group would not permit a thorough examination of the effects of the demonstration on the utilization of chiropractic services. The reason for this is that many chiropractors billed Medicare for expanded services before the demonstration. Even though these bills were denied, the services they include probably represented actual utilization by Medicare beneficiaries.

Chiropractors may have been motivated to submit claims to Medicare for non-covered services for several reasons. First, because many chiropractors use the same billing process for all patients regardless of payer, they may routinely list all services provided on all claims regardless of insurer or the likelihood of denied payment. Second, chiropractors may have submitted bills for expanded services that they knew would be denied because they needed a denial from Medicare to be able to bill other insurers.

Finally, they may have submitted expanded service bills to Medicare to satisfy patients' request and provide proof that such services were not Medicare covered.

This analysis focuses on claims submitted to Medicare to examine utilization of expanded chiropractic services, rather than limiting itself to claims paid by Medicare, for three principal reasons: (1) to assess the services that were actually received by the beneficiaries; (2) to permit meaningful before and after comparisons of the demonstration's effects within demonstration areas; and (3) to ensure inclusive comparisons of the use of expanded services between demonstration and comparison areas.

'Visit' versus 'Service' as the Measure of Utilization: The analysis is based on claims with primary NMS diagnoses (**Appendix B**). The most specific unit of utilization on a Medicare claim is the procedure or type of 'service' provided. This analysis, however, used the aggregation of services during a 'visit' as the unit of analysis for both utilization and reimbursements. Here, 'visit' was defined as an encounter with a provider on a given day for clinical services with a NMS diagnosis. Chiropractic visits are those for which the provider is a chiropractor (provider type = 35), and other NMS-related visits have some other provider type including suppliers of medical (e.g. laboratory or imaging) services. Visits providing at least one expanded service are called expanded service visits, and visits providing only standard chiropractic services are called standard service visits. Because a visit can include multiple services or only a single service, and can be costly or relatively inexpensive, the number of visits and total reimbursements represent separate and distinct measures of the demonstration's impact. Hence, it is informative to examine both the number of procedures and the total payments for a visit.

Statistical Analysis: Comparisons are between beneficiaries from demonstration and comparison counties in the classification sets shown in **Figure 4.1**. Taking advantage of what is essentially a pre-post, treatment-comparison design, difference-in-difference statistics were constructed from the claims for comparable six-month time periods, and were used to estimate the effects of the demonstration on utilization of services and costs. Beginning with large cohorts of beneficiaries from demonstration and comparison areas matched on county demographic characteristics and Medicare utilization measures, the approach uses pre-demonstration information to adjust for differences between demonstration and comparison subjects that may remain despite efforts to match them. Further, it adjusts for changes over time in the use of chiropractic services and other NMS-related treatment issues that are unrelated to the demonstration but still may influence its outcomes.

Difference-in-difference statistics are computed for various measures using the three cohorts of beneficiaries. Findings that are large, consistent, and statistically significant across time periods in repeated comparisons have the greatest policy importance. The demonstration is repeated in five market areas (counting Scott County, IA as distinct from northern IL counties), and clustered within those regions

in a total of 92 counties. The demonstration's effect was estimated in terms of the percentage of beneficiaries using a specific service as a proportion of their respective beneficiary samples⁵:

$$demo\ effect = (p_{D,1} - p_{D,0}) - (p_{C,1} - p_{C,0}),$$

where p is the prevalence of service users in the respective areas, subscripts D and C distinguish demonstration and comparison subjects, and subscripts 0 and 1 distinguish between time 0 (the pre-demonstration period) and time 1 (the demonstration period).

Similarly, analyses of the effects of the demonstration on the number of visits and Medicare reimbursements use a simple 'difference-in-differences' t-statistic that is appropriate for continuous measures:

$$t = (Y_{D,1} - Y_{D,0}) - (Y_{C,1} - Y_{C,0}),$$

where Y is the mean of the continuous outcome of interest (visits or payments), subscripts D and C distinguish demonstration and comparison subjects, and subscripts 0 and 1 distinguish between time 0 (pre-demonstration period) and time 1 (demonstration period).

Outcome Measures: Medicare utilization and payment outcome measures for relevant cohorts are summarized in **Table 4.1**. User rates are calculated and compared for beneficiary cohorts A and B, while utilization and reimbursements analyses focus on the cohorts B and C of chiropractic service users.

⁵ In subsequent analyses, multivariate regressions will be used to control for important covariates (e.g., beneficiary- or county-level characteristics) in estimating the effects of the demonstration on reimbursement and utilization. The 'difference-in-differences' technique adjusts for different case-mixes in different areas but does not adjust for changes in case-mix that take place in some areas but not others. A possible threat to validity is that the case-mix in the demonstration area will change relative to the control area, coincident with the onset of the demonstration. The competing effects of this unlikely, but still feasible, possibility will be further reduced via multivariate, risk-adjusted models. An ever-present concern would be the threat of non-equivalent market-wide changes in a demonstration or comparison areas, such as differential trends in utilization by specialty (e.g., neurology or orthopedics)

Table 4.1: Outcomes

Beneficiary Cohorts	Outcome Measures – Utilization and Reimbursements
Beneficiaries with a covered NMS diagnosis (cohorts A and A' in Figure 4.1)	User rate for any chiropractic services User rate for expanded chiropractic services User rate for other (non-chiropractic) NMS-related services
Beneficiaries receiving any chiropractic services (cohorts B and B')	User rate for expanded chiropractic services User rate for other (non-chiropractic) NMS-related services
Beneficiaries receiving any chiropractic services (cohorts B and B') Beneficiaries receiving expanded services (cohorts C and C')	Number of visits for <ul style="list-style-type: none"> • standard chiropractic services • expanded chiropractic services • other NMS-related services
Beneficiaries receiving any chiropractic service (cohorts B and B') Beneficiaries receiving expanded services (cohorts C and C')	Payments for <ul style="list-style-type: none"> • standard chiropractic services • expanded chiropractic services • other NMS-related services • all NMS-related services

Subgroup Analyses : The beneficiary and county level characteristics listed in **Table 4.2** were used to classify demonstration and comparison area beneficiaries into subgroups, which were then compared.

Table 4.2: Classifying Variables for Subgroups

Category	Characteristic
Beneficiary level	Specific ICD-9 diagnosis codes are classified as spinal, extremity, or neurological
County level	Urban/rural status of county of residence HPSA/non-HPSA status of county of residence State of residence Demonstration area indicator (for state-specific analyses)

At the beneficiary level, each NMS diagnosis was identified as one of three types: spine, extremities, or neurological system. A full year of claims was used to classify beneficiaries into seven distinct diagnostic subgroups based on combinations of these diagnoses. At the county level, two characteristics (urban or rural and HPSA or non-HPSA) were used to classify counties into four corresponding categories. The county of residence determined the demonstration area for which the beneficiary's data were used in planned state-specific analyses.

C. Results

1. Effects of the Demonstration on User Rates of NMS-related Services

The claims analysis pertains to about 994,000 beneficiaries in demonstration areas and 571,000 beneficiaries in comparison areas who were treated for NMS diagnoses in the first year of the demonstration. **Table 4.3** summarizes data on user rates of services for NMS diagnoses for the year prior to and two years of the demonstration. Here, “user” is defined by the submission to Medicare of at least one claim for a NMS diagnosis for the type of service indicated within a specified time period. Such a claim was assumed to reflect actual delivery of the service to the beneficiary, whether or not it was reimbursed by Medicare. In the pre-demonstration period, user rates for all chiropractic services were lower in demonstration than in comparison areas (10.0 percent vs. 13.1 percent), as were user rates for expanded chiropractic services (4.4 percent vs. 6.4 percent). These findings indicate that user rates in demonstration and comparison areas were closely, though not perfectly, matched thus confirming the appropriateness of the difference-in-difference statistical approach to judging demonstration effects.

During the demonstration, users of expanded chiropractic services increased from 4.4 percent to 4.9 and 5.1 percent in Years 1 and 2, respectively, in demonstration areas, while decreasing slightly in comparison areas. User rates of all chiropractic services also increased slightly in the demonstration areas; while users of other (non-chiropractic) NMS services decreased slightly. Corresponding rates did not change in comparison areas. About 95 percent of all beneficiaries with NMS diagnoses received other (non-chiropractic) NMS services, and about 45 percent of chiropractic users also received non-chiropractic NMS services. The percent of users of both chiropractic and other types of NMS services increased somewhat in the demonstration areas while decreasing in the comparison areas. The main demonstration effects, therefore, were modest increases in users of expanded chiropractic services and users of both chiropractic and other NMS services. The explanation for the decrease in use of both chiropractic and other NMS services in comparison areas was not evident.

Table 4.3: User Rates in Demonstration and Comparison Regions - by Type of Service *

Time Period	Total Beneficiaries with NMS Diagnoses	Percent Users of Other NMS Services	Percent Users of All Chiropractic Services	Percent Users of Expanded Chiropractic Services	Percent Users of Both Chiropractic and Other Types of NMS Services
Demonstration Regions					
<i>Pre-Demo</i>					
Pre-Year	951,825	96.2%	10.0%	4.4%	43.7%
<i>Demonstration</i>					
1st Year	994,052	95.3%	10.8%	4.9%	45.2%
2nd Year	991,265	95.3%	11.2%	5.1%	45.2%
Matched Comparison Regions					
<i>Pre-Demo</i>					
Pre-Year	569,704	94.7%	13.1%	6.4%	49.1%
<i>Demonstration</i>					
1st Year	571,166	94.9%	12.9%	5.9%	45.9%
2nd Year	566,867	94.9%	13.0%	6.0%	45.9%

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

Table 4.4 compares changes in use rates in demonstration and comparison counties using difference-in-difference analysis. The use of any expanded chiropractic service increased in demonstration areas relative to comparison areas by 12 and 16 percent in the first and second years of the demonstration, respectively (odds ratios 1.12 and 1.16). Corresponding user rates of any chiropractic service increased by 9 and 13 percent in demonstration areas; while the use of other (non-chiropractic) NMS services decreased by 19 percent in each year (odds ratios 0.81, $p < 0.0001$). These findings need to be interpreted in light of the definition of user which was based on claims submitted rather than bills paid by Medicare.

Table 4.4 Demonstration-induced Changes in Users of NMS-related Services – All Beneficiaries with NMS Diagnoses

Time Periods	Odds Ratio for Use of Other NMS Services	p-value	Odds Ratio for Use of Any Chiropractic Services	p-value	Odds Ratio for 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 percentage service users, both before and during the demonstration, reflect all claims billed to Medicare, paid and denied.

2. Effects of the Demonstration on Visit Rates

The impacts of the demonstration on the utilization of services were examined in terms of the number of visits per user during six-month periods. **Tables 4.5** and **4.6** provide results for users of expanded chiropractic services, and **Tables 4.7** and **4.8** do the same for users of any chiropractic services.

In demonstration areas, users of expanded chiropractic services increased by 69 percent from about 29,000 before the demonstration to about 49,000 during it (means of individual values for six-month periods), while not changing in comparison areas (**Table 4.5**). Visits per user of expanded chiropractic services increased by about 50% from a mean of 3.4 visits to 5.1 visits per six-month period (means not shown) while increasing slightly in comparison areas. Corresponding decreases occurred in visits for only standard chiropractic services, while visits for other NMS services did not change. The explanation for the increase in visit for standard chiropractic during the final six months in the demonstration areas is not evident. Utilization rates did not change in comparison areas.

Table 4.5: Visit Rates per User in Demonstration and Comparison Regions - Expanded Chiropractic Service Users *

Time Period	Expanded Chiropractic Services	Visits for Other NMS Services per User	Visits for Standard Chiropractic Services Only per User	Visits including Expanded Chiropractic Services per	Total Chiropractic Visits per User
Demonstration Regions					
<i>Pre-Demo</i>					
Summer '04	29,213	2.5	2.8	3.4	6.2
Winter '04-'05	28,485	2.4	2.9	3.3	6.2
<i>During Demo</i>					
Summer '05	47,043	2.6	1.7	4.7	6.4
Winter '05-'06	47,079	2.6	1.2	5.2	6.4
Summer '06	50,925	2.6	1.0	5.2	6.2
Winter '06-'07	50,526	2.4	2.3	5.3	7.6
Matched Comparison Regions					
<i>Pre-Demo</i>					
Summer '04	28,307	2.1	2.5	3.5	6.0
Winter '04-'05	27,077	2.1	2.6	3.4	6.0
<i>During Demo</i>					
Summer '05	29,493	2.2	2.7	3.6	6.3
Winter '05-'06	27,306	2.1	2.6	3.6	6.2
Summer '06	28,147	2.1	2.7	3.7	6.4
Winter '06-'07	27,113	2.1	3.0	3.6	6.6

* 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.

Difference-in-difference results for NMS-related visits in expanded chiropractic service users show a progressive increase in visits for expanded services in demonstration areas compared with comparison areas (**Table 4.6**). Corresponding changes in all visits for all chiropractic services and for other NMS services were small and inconsistent in direction. An exception was in the final six months of the demonstration when total visits for chiropractic services increased significantly in demonstration areas. This finding is consistent with the increase in visits for standard chiropractic visits in **Table 4.5**.

Table 4.6: Demonstration-induced Changes in NMS-related Visits - Expanded Chiropractic Service Users *

Time Periods	Visits for Other NMS Services	p-value	Total Visits for 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

Tables 4.7 and 4.8 provide parallel results for all chiropractic service users. Visits that included expanded services more than doubled in demonstration areas from 1.2-1.3 (mean 1.25) to 2.6-3.2 visits (mean 3.0) per 6-month period; while visits for standard chiropractic services decreased from a mean of 4.1 to a mean of 3.0 visits per six-month period during the demonstration, and visits for non-chiropractic NMS services increased slightly. Only small changes were observed in comparison areas.

Table 4.7: Visit Rates per User in Demonstration and Comparison Regions - All Chiropractic Users

Time Period	All Chiropractic Services Users	Visits for Other NMS Services per User	Visits for Standard Chiropractic Services Only	Visits Including Expanded Chiropractic Services per User	Total Chiropractic Visits per User
Demonstration Regions					
<i>Pre-Demo</i>					
Summer '04	77,909	2.2	4.1	1.3	5.4
Winter '04-'05	76,405	2.2	4.1	1.2	5.3
<i>During Demo</i>					
Summer '05	82,924	2.4	3.1	2.6	5.7
Winter '05-'06	80,926	2.3	2.8	3	5.8
Summer '06	83,363	2.4	2.7	3.2	5.9
Winter '06-'07	83,977	2.4	3.3	3.2	6.5
Matched Comparison Regions					
<i>Pre-Demo</i>					
Summer '04	64,844	1.9	3.9	1.5	5.4
Winter '04-'05	64,118	1.8	3.8	1.4	5.2
<i>During Demo</i>					
Summer '05	67,846	2	3.9	1.6	5.5
Winter '05-'06	64,981	1.9	3.9	1.5	5.4
Summer '06	65,924	1.9	4	1.6	5.6
Winter '06-'07	65,269	2.2	4	1.5	5.5

* 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.

Difference-in-difference results for all chiropractic users (**Table 4.8**) show variable but highly significant differences between demonstration and comparison areas in the use of expanded services with increases ranging from 0.55 to 1.94 visits per six-month period. The reason for the lower value in Summer 2006 is not evident. Increases in expanded and total chiropractic visits were largest during the final six months of the demonstration. Results for visits for other NMS services were small and inconsistent in direction. The decrease in non-chiropractic NMS visits during the final six months of the demonstration, coupled with the increases in chiropractic visits suggests a possible substitution effect. Overall, these results confirm that the increased visits for expanded services represent true increases and are not the result of selection bias.

Table 4.8: Demonstration-induced Changes in Visits for NMS-related Services - All Chiropractic Service Users *

Time Period	Visits for Other NMS Services	p-value	Total Visits for Chiropractic Services	p-value	Visits for Expanded Chiropractic Services	p-value
Summer '05 vs. Summer '04	0.05	0.17	0.16	0.004	1.33	<0.0001
Winter '05-'06 vs. Winter '04-'05	0.06	0.05	0.36	<0.0001	1.73	<0.0001
Summer '06 vs. Summer '04	0.11	0.005	0.13	0.035	0.55	<0.0001
Winter '06-'07 vs. Winter '04-'05	-0.23	<0.0001	0.87	<0.0001	1.94	<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.

3. Effects of the Demonstration on Medicare Reimbursements

Effects of the demonstration on Medicare reimbursements in users of expanded chiropractic services are shown in **Tables 4.9** and **4.10** and in users of all chiropractic services in **Tables 4.11** and **4.12**. **Tables 4.13** and **4.14** then summarize the effects on total Medicare reimbursements for chiropractic services.

The number of expanded services users increased by 69 percent in demonstration areas but was essentially unchanged in comparison areas. Mean payments per user for all NMS services increased by 47 percent in demonstration areas from a mean of \$468 to a mean \$690 per 6-month period (**Table 4.9** – mean values not shown), with corresponding increases of 6 percent in comparison areas. Expanded chiropractic services accounted for 81 percent of the total increase. Small increases were also found in payments for standard chiropractic services and non-chiropractic NMS services in both demonstration and comparison areas.

Table 4.9: Medicare Reimbursements for Chiropractic Services in Beneficiaries with NMS Diagnoses in Demonstration and Comparison Regions - Expanded Chiropractic Service Users*

Time Period	Number of Expanded Chiropractic Service Users	Payments for Standard Services per User	Payments for Expanded Services per User	Payments for Other NMS Services per User	Total Payments for All
Demonstration Regions					
<i>Pre-Demo</i>					
Summer '04	29,213	\$222	\$0	\$269	\$491
Winter '04-'05	28,485	\$192	\$0	\$252	\$445
<i>During Demo</i>					
Summer '05	47,043	\$234	\$152	\$299	\$685
Winter '05-'06	47,079	\$211	\$182	\$286	\$679
Summer '06	50,925	\$225	\$192	\$305	\$723
Winter '06-'07	50,526	\$203	\$184	\$286	\$673
Matched Comparison Regions					
<i>Pre-Demo</i>					
Summer '04	28,317	\$194	\$0	\$220	\$414
Winter '04-'05	27,077	\$166	\$0	\$211	\$377
<i>During Demo</i>					
Summer '05	29,493	\$205	\$0	\$238	\$443
Winter '05-'06	27,306	\$175	\$0	\$217	\$392
Summer '06	28,147	\$204	\$0	\$230	\$435
Winter '06-'07	27,113	\$175	\$0	\$229	\$404

* Payments are per user during the indicated 6-month period.

Table 4.10 provides corresponding difference-in-difference results. In expanded chiropractic service users, payments for expanded services increased by \$152 to \$195 more per six-month period in demonstration than in comparison areas; while payments for all chiropractic services increased by \$153 to \$192. Payments for other types of NMS services increased by only \$12 to \$27 more per six-month period.

Table 4.10: Demonstration-induced Changes in Medicare Reimbursements for NMS-related Services – Expanded Chiropractic Service Users *

Time Period	Payments for Other NMS Services	p-value	Payment 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

Tables 4.11 and 4.12 present parallel results for all chiropractic service users and provide validity checks on two potential sources of bias to the difference-in-difference method of analysis. First, the cohort of beneficiaries who received expanded services under the demonstration may have different case-mix severity profiles than those who did not if chiropractors took advantage of expanded coverage to provide expanded services to less (or more) medically needy patients. Second, even if the characteristics of patients who received expanded services did not change, chiropractors who participated in the demonstration might have become more accurate in submitting claims for the services they did provide once they became reimbursable. Each of these situations represents a potential ‘selection by treatment’ validity threat that might undermine the comparability of difference-in-difference results between demonstration and comparison areas. Results based on all chiropractic service users are not as vulnerable to the first bias and would help to identify the second bias, if it were large enough to be important.

The main impact of the demonstration on all chiropractic users was to increase reimbursements for expanded services, while having only small effects on reimbursements for standard chiropractic and non-chiropractic NMS services (**Table 4.11**). The difference-in-difference results in **Table 4.12** shows that reimbursements for any chiropractic services in all chiropractic users increased by \$89 to \$123 more per six-month period in demonstration than in comparison area users; and those for expanded services increased by \$86 to \$117. Changes in reimbursements for other NMS-related services were small and variable. All results are statistically significant, however, because of the large sample sizes involved. Hence, results expanded chiropractic service users and all chiropractic service users closely parallel one another and support the conclusion that biases did not seriously undermine results based only on users of expanded chiropractic services.

Table 4.11: Medicare Reimbursements per Six-Month Period - All Chiropractic Service Users *

Time Period	Number of Chiropractic Service Users	Payments for Standard Services per User	Payments for Expanded Services per User	Payments for Other NMS Services per User	Total Payments for All NMS Services
Demonstration Region					
<i>Pre-Demo</i>					
Summer '04	77,909	195	0	237	432
Winter '04-'05	76,405	160	0	233	393
<i>During Demo</i>					
Summer '05	82,924	204	86	272	562
Winter '05-'06	80,926	181	106	252	540
Summer '06	83,363	205	117	276	598
Winter '05-'06	83,977	184	110	276	560
Matched Comparison Regions					
<i>Pre-Demo</i>					
Summer '04	64844	173	0	197	370
Winter '04-'05	64118	143	0	190	333
<i>During Demo</i>					
Summer '05	67846	179	0	218	397
Winter '05-'06	64981	151	0	201	352
Summer '06	65924	177	0	213	390
Winter '06-'07	65269	148	0	249	397

* Payments are per user during the indicated 6-month period.

Table 4.12: Demonstration-induced Effects on Reimbursements for NMS-related Services - All Chiropractic Service Users *

Time Period	Payments for Other NMS Services	p-value	Payments for Any Chiropractic Services	p-value	Payments for Any Expanded Chiropractic Service	p-value
Summer '05 vs. Summer '04	15	<0.0001	89	<0.0001	86	<0.0001
Winter '05-'06 vs. Winter '04-'05	10	<0.0001	118	<0.0001	106	<0.0001
Summer '06 vs. Summer '04	22	<0.0001	123	<0.0001	117	<0.0001
Winter '06-'07 vs. Winter '04-'05	-16	<0.0001	119	<0.0001	110	<0.0001

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

Effects of the Demonstration on Total Medicare Expenditures for Chiropractic Services: Table 4.13

shows the main effects of the demonstration on Medicare expenditures for chiropractic services in expanded chiropractic service users. Expenditures for all chiropractic services increased from about \$12 million per year before the demonstration to \$36.7 million in Year 1 and \$40.8 million in Year 2 of the demonstration for a net increase of \$26.5 million per year. Of this increase, about two-thirds (\$17.4 million) was due to the coverage of expanded services and one-third (\$9.1 million) was due to standard services received by the increased numbers of expanded service users. In comparison regions, expenditures for all chiropractic services increased by only 5 - 6 percent per year. These results do not include any possible cost offsets from the reduced use of non-chiropractic services including ambulatory services, hospitalizations, and medications.

Table 4.13: 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 Regions			
<i>Pre-Demo</i>			
Year	\$0.0	\$12.0	\$12.0
<i>During Demo</i>			
Year 1	\$15.7	\$20.9	\$36.7
Year 2	\$19.1	\$21.7	\$40.8
Total	\$34.8	\$42.7	\$77.5
Comparison Regions			
<i>Pre-Demo</i>			
Year	\$0.0	\$10.0	\$10.0
<i>During Demo</i>			
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

4. Effects of the Demonstration on Expanded Service Users and Reimbursements in Urban/Rural and HPSA/non-HPSA Locations

More than two-thirds of expanded service users were treated by chiropractors in urban/non-HPSA areas before and during the demonstration (**Table 4.14**). Reimbursements per user for all chiropractic services

before the demonstration and increases per user during it were highest in urban/non-HPSA areas, followed in descending order by rural/non-HPSA areas, rural/HPSA areas, and urban/HPSA areas. For example, reimbursements per expanded service user per six-month period, in the pre-demonstration period, ranged from \$199-\$229 in urban/non-HPSA areas, but were only \$142-\$159 in rural HPSA areas. Corresponding figures during the demonstration were \$421-\$459 and \$211-\$275, respectively. The greatest impacts of the demonstration, therefore, were in urban non-HPSA areas rather than in rural or HPSA areas.

Table 4.14: Effects of the Demonstration on the Numbers of Expanded Chiropractic Service Users and Reimbursements Per User in Urban or Rural and HPSA or non-HPSA Locations*

Time Period	# of Expanded Chiropractic Service Users				Reimbursements (\$) for All Services per User			
	Urban Non-HPSA	Urban HPSA	Rural Non-HPSA	Rural HPSA	Urban Non-HPSA	Urban HPSA	Rural Non-HPSA	Rural HPSA
<i>Pre-Demo</i>								
Summer '04	20,831	168	7,108	1,197	\$229	\$165	\$211	\$159
Winter '04-'05	20,632	181	6,581	1,183	\$199	\$155	\$179	\$142
<i>During Demo</i>								
Summer '05	32,658	356	12,142	2,046	\$421	\$192	\$314	\$245
Winter '05-'06	33,232	334	11,947	1,724	\$440	\$175	\$285	\$242
Summer '06	36,164	369	12,653	1,849	\$459	\$180	\$321	\$275
Winter '06-'07	34,936	320	12,278	2,880	\$440	\$195	\$229	\$211

*Reimbursements are per user for the indicated 6 month period.

5. Effects of the Demonstration on Reimbursements in Different Diagnostic Groups

The demonstration expanded Medicare coverage for chiropractic services from only manipulation of the spine to also include the treatment of clinical problems affecting the arms and legs (extremities) and the neurological system. Hence, diagnoses recorded by chiropractors in Medicare claims became more varied and complex. Important objectives of this evaluation are to examine the demonstration's effects on the diagnostic mix of patients treated and on services provided to each diagnostic group. **Table 4.15** provides difference-in-difference results for users of expanded chiropractic service for the three largest diagnostic subgroups (spine only, spine plus extremities, and extremities only). Analyses were calculated as the demonstration was ongoing and cover only the 12 months before the demonstration and first 30 months during it. Together, these diagnostic groups include about 94 percent of expanded service users in both demonstration and comparison areas. However, there was some shifting in diagnostic mix during the demonstration. In the spinal-only subgroup, the proportion of expanded service users decreased by 6.4 percent to 9.8 percent in different 6-month periods compared in demonstration areas with comparison

areas. Offsetting this were increases in the spine plus extremity group and the extremities only group. Visits per user for any NMS service increased more in demonstration areas - modestly in the spinal only group (by 0.27 -0.61 visits per six-month period) and spinal plus extremity groups (by 0.27 - 0.89 visits) and more in the extremities only group (by 1.62 - 2.10 visits). Reimbursements per user per six-month period for all NMS services showed the same pattern with modest increases in the spinal-only group (range of \$119 to \$165 per user) and spinal plus extremity groups (range of \$143 to \$227 per user) and larger increases in the extremity only group (range of \$239 to \$382 per user). All results were statistically significant except for increases during the ramp-up of the demonstration for the number of expanded service users in the extremities-only group.

Table 4.15: Effects of the Demonstration on Reimbursements for NMS-related Services by Diagnostic Group

A. Expanded Chiropractic Service Users with Spinal-only Diagnosis*

Time Period	Diff-in-Diff % of Expanded Service Users	p-value	Diff-in- Diff Number of Visits	p-value	Diff-in-Diff \$ for Any NMS Related Services	p-value
Summer '05 vs. Summer '04	-7.1	<0.0001	0.31	<0.0001	\$119	<0.0001
Winter '05-'06 vs. Winter '04-'05	-6.4	<0.0001	0.61	<0.0001	\$165	<0.0001
Summer '06 vs. Summer '04	-9.8	<0.0001	0.27	<0.0001	\$148	<0.0001

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

Analysis for this table is based on a 30-month time period; the 12 months before the demonstration and the first 18 months during it.

B. Expanded Chiropractic Service Users with Spinal and Extremities Diagnoses*

Time Period	Diff-in-Diff % of Expanded Service Users	p-value	Diff-in- Diff Number of Visits	p-value	Diff-in-Diff \$ for Any NMS Related Services	p-value
Summer '05 vs. Summer '04	4.4	<0.0001	0.27	<0.0001	\$143	<0.0001
Winter '05-'06 vs. Winter '04-'05	4.5	<0.0001	0.89	<0.0001	\$200	<0.0001
Summer '06 vs. Summer '04	5.2	<0.0001	0.83	<0.0001	\$227	<0.0001

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

Analysis for this table is based on a 30-month time period; the 12 months before the demonstration and the first 18 months during it.

C. Expanded Chiropractic Service Users with Extremities-only Diagnosis*

Time Period	Diff-in-Diff % of Expanded Service Users	p-value	Diff-in- Diff Number of Visits	p-value	Diff-in-Diff \$ for Any NMS Related Services	p-value
Summer '05 vs. Summer '04	1.8	0.14	1.62	<0.0001	\$239	<0.0001
Winter '05-'06 vs. Winter '04-'05	0.6	<0.0001	1.9	<0.0001	\$323	<0.0001
Summer '06 vs. Summer '04	2.6	<0.0001	2.1	<0.0001	\$382	<0.0001

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

Analysis for this table is based on a 30-month time period; the 12 months before the demonstration and the first 18 months during it.

6. Denial Rates of Claims during the Demonstration

Examination of claims denial rates and their trends over the course of the demonstration provide important perspectives. The issue of denial rates is made complex by two factors. First, the demonstration required that chiropractors submit two claims for each service – one for standard services (i.e. spinal manipulation) and the other for expanded services covered under the demonstration using the demonstration’s code number ‘45’ and appropriate claims modifiers. Otherwise, claims for expanded services were denied. Second, as described previously under **Methods** and in **Table 4.3**, claims for expanded services were frequent in both demonstration and comparison regions before the demonstration began even though they were denied. In analyzing claims denials, therefore, it is very important to distinguish between bills submitted to obtain Medicare reimbursement and those submitted for other reasons.

In this report, denial rates were calculated in two ways: (1) using all claims submitted for expanded services during the period of the demonstration and (2) using only claims for expanded services containing the demonstration’s ‘45’ code. When chiropractors included ‘45’ on expanded service claims, they clearly wanted to participate in the demonstration, and denial rates indicated how frequently other factors prevented them from being reimbursed. **Table 4.16** provides overall denial rates, overall and by demonstration area (state) for all expanded service claims; while **Table 4.17** is limited to claims with a ‘45’ code. Overall, expanded service claims can be grouped into four categories: (1) paid claims with the ‘45’; (2) paid claims without the ‘45’; (3) denied claims with ‘45’⁶ and (4) denied claims without ‘45’. The denominators for the ‘all claims’ ratios are the totals for all expanded services, while the denominators for the ‘45’ code ratios are the totals on ‘45’ claims. Expanded service claims paid without containing the ‘45’

⁶ Such claims could be denied for other reasons such as not medically necessary or not active treatment.

indicator conflict with Medicare's regulations and requirements of the demonstration. This category was very small in demonstration areas during the demonstration and contained only 1,200 (0.17 percent) of the more than 580,000 expanded service claims. Because of this, all paid expanded service claims have been collapsed into one category for rate calculation purposes.

Denial rates for expanded service claims varied from state-to-state and also varied from the beginning to the end of the demonstration (**Table 4.16**). Prior to the demonstration, they were 100%. During the demonstration, Maine had the lowest denial rates early in the demonstration (35 percent) and also at its end (25 percent). Denial rates in other states ranged from 41 to 46 percent initially but decreased substantially as the demonstration progressed to 27 to 32 percent. Using expanded service claims with a code '45' (**Table 4.17**), denial rates ranged from 19 to 24 percent in all states except New Mexico in which it was 36 percent. Rates fell substantially in all states during the demonstration.

Table 4.16: Denial Rates for All Expanded Service Claims in Demonstration Areas*

Time Period	Percent of Claims Denied					
	All Demo Areas	Maine	Virginia	Illinois	Iowa	New Mexico
<i>Pre-Demo</i>						
Summer '04	100	100	100	100	100	100
Winter '04-'05	100	100	100	100	100	100
<i>During Demo</i>						
Summer '05	41.7	34.8	40.7	42.1	46.0	45.4
Winter '05-'06	28.8	24.1	28.9	29.2	29.8	30.0
Summer '06	31.0	25.4	31.9	32.0	27.0	27.2

*All claims for expanded coverage services were denied in the pre-demonstration period.

Analysis for this table is based on a 30-month time period; the 12 months before the demonstration and the first 18 months during it.

Table 4.17: Claims Denial Rates for Expanded Services with the Demonstration Code “45” in Demonstration Areas *

Time Period	Percent of Claims Denied					
	All Demo Areas	Maine	Virginia	Illinois	Iowa	New Mexico
<i>Pre-Demo</i>						
Summer '04	100	100	100	100	100	100
Winter '04-'05	100	100	100	100	100	100
<i>During Demo</i>						
Summer '05	23.9	20.0	23.6	23.3	19.0	35.9
Winter '05-'06	14.9	9.3	13.6	15.0	11.8	21.4
Summer '06	17.8	10.5	16.1	18.7	9.7	18.9

*All claims for expanded coverage services were denied in the pre-demonstration period.

Analysis for this table is based on a 30-month time period; the 12 months before the demonstration and the first 18 months during it.

The distinction between denial rates using expanded service claims with code ‘45’ and those for all expanded services is an important one. Based on all submitted chiropractic claims, denial rates for expanded services started high (averaging 41.6 percent across all demonstration areas) and declined over time (averaging 31 percent for the last six months of the demonstration). This decline probably

reflected the chiropractors' learning curve and increasing adherence to the demonstration's reimbursement procedures. Overall denial rates for the demonstration areas based on expanded service claims with '45' codes started at 23.9 percent and declined over time to 14.9 or 17.8 percent in different six-month periods. Clearly, the absence of the code '45' on the claim was a major reason submitted expanded services were not reimbursed.

D. Summary and Discussion

Goals of the Analysis: This analysis examined the effects of the demonstration on the utilization of chiropractic services and on Medicare reimbursements in beneficiaries with one or more NMS diagnoses involving the spine, extremities, or neurological system. Its primary focus was on patterns of use and reimbursements for expanded chiropractic services. Attention was also given, however, to examining effects on standard chiropractic and Medicare Part B non-chiropractic services overall and in diagnostic subgroups and in particular geographic areas identified by their urban or rural and HPSA or non-HPSA designations. Finally, patterns of claims' denial rates were examined.

Design Features: The demonstration included four geographic areas: the whole states of Maine and New Mexico, and selected counties in Illinois, Iowa, and Virginia. Each demonstration county was matched to two comparison counties on key utilization variables and on the Medicare Part B carrier. The evaluation included all beneficiaries in demonstration and comparison areas who had an NMS-related diagnosis appearing on a Medicare Part B claim during a given six-month period. In selecting the sample, all claims for fee-for-service beneficiaries during the year before the demonstration (April 1, 2004 through March 31, 2005) and the demonstration period (April 1, 2005 through March 31, 2007) were examined. In the analysis, "user" was defined as a beneficiary who had at least one visit during a 6-month period for the particular type of service being examined: standard chiropractic, expanded chiropractic, or other (non-chiropractic) NMS service; a "visit" was defined as any claim for a service on a given day for a principal NMS diagnosis; and "reimbursement" was the sum of paid claims. Difference-in-difference analysis was applied to determine the effects of the demonstration adjusting for patterns of care in comparison counties and pre-demonstration time periods for the same 6-month period in summer or winter.

Main Results: About 10 percent of beneficiaries with NMS diagnoses used chiropractic services. The most important impacts of the demonstration were to increase users of expanded services by 69 percent (**Table 4.5**) and to increase visits for expanded services by an average of 60 percent over the course of the demonstration (**Table 4.6**). Medicare reimbursements per user for expanded chiropractic services increased by an average of \$180 per six-month period (**Table 4.10**), and Medicare expenditures for all expanded chiropractic services increased by \$34.8 million in demonstration counties (**Table 4.13**). No cost offsets were found in reimbursements for other (non-chiropractic) NMS-related ambulatory services.

Possible offsets in the use and costs of hospitalizations or other Part A services are examined in Chapter V of this report.

Reimbursements per expanded chiropractic service user for all NMS-related services more than doubled in urban/non-HPSA areas followed in descending order by rural/non-HPSA, rural/HPSA, and urban/HPSA areas.

Effects in Diagnostic Subgroups: The demonstration extended coverage to a broad range of NMS diagnoses. The most important changes in diagnostic mix were increases of users with diagnoses affecting both the spine and extremities and corresponding decreases in the “spinal only” group. Reimbursements per user varied more than two-fold among diagnostic groups and were highest in the extremity only and neurological groups.

Claims Denial Rates: Claims denial rates differed considerably by whether they were based on all expanded service claims or only claims having a demonstration code ‘45’ on them. Overall, denial rates fell from 42 percent to 31 percent over the course of the demonstration; while denial rates based on code ‘45’ claims fell from 24 to 18 percent. Patterns of denials varied considerably by state. The decrease in denial rates over time probably reflects learning curves by both chiropractors and Medicare carriers.

Seasonality of Chiropractic Services: Higher chiropractor visit rates and costs were found in the summer months (April-September). These findings may reflect increased physical activity and injuries during summer months or easier access to chiropractic services.

Strengths of the Analysis: The analysis provides a thorough assessment of the effects of the demonstration on the use and costs of Medicare-covered services. Strengths include the large number of beneficiaries available for study, a sound analytic comparison design, use of sophisticated matching techniques to select comparison counties, the inclusion of pre-demonstration claims to examine and adjust for differences between demonstration and comparison areas, and the use of a rigorous statistical approach of difference-in-differences analysis to adjust for residual differences in baseline periods, changes over time, and seasonal variations in the use of chiropractic services.

Limitations of the Analysis: One limitation is that the analysis relies solely on Medicare claims data to calculate effects of expanded coverage of chiropractic services during the demonstration. Utilization of expanded chiropractic services will be underestimated to the extent that claims are denied by Medicare, that they are covered by other insurers, or are paid by the patient out-of-pocket. The main focus of the evaluation on Medicare payments for expanded chiropractic coverage will not be affected, however. A second limitation is that analyses are based on only two years of follow-up and, then, only on Part B claims. Potential cost offsets from avoided hospitalizations resulting from the increased use of

chiropractic services may become evident only over longer periods of follow-up and then only by including Part A Medicare claims. A third limitation is that Part D data were not available to examine the impact of expanded chiropractic services on the use and costs of pain medications. Finally, 'code creep' may have affected the diagnostic subgroup analysis. This would occur, for example, if chiropractors responded to the demonstration by recording additional diagnoses for their patients that would not have been noted otherwise. Such 'code creep' could exaggerate the complexity of patients and lead to underestimation of Part B costs in diagnostic subgroup analyses and overestimation of cost savings in case-mix adjusted multivariate analyses. An analysis of "code creep" would require detailed examination of changes in diagnostic codes over time, and was beyond the scope of the analysis.

V. ANALYSIS OF BUDGET NEUTRALITY OF THE DEMONSTRATION

A. Objectives

This analysis examines the effects of expanded coverage for chiropractic services under the demonstration on Medicare payments for the treatment of neuromusculoskeletal (NMS) diagnoses. It compares payments in the demonstration areas to matched comparison areas during the year before the demonstration and the two years of the demonstration from April 1, 2005 through March 31, 2007. The focus is on two populations: (1) all beneficiaries with NMS diagnoses and (2) the subgroup of beneficiaries who received chiropractic services. Medicare payments of interest include both institutional and non-institutional services. The former includes hospitalizations and admissions to skilled nursing or rehabilitation facilities; while the latter includes both chiropractic services and ambulatory services by other types of providers. The analysis examines overall effects of the demonstration on Medicare payments and also examines effects in each demonstration area, rural and urban areas, health provider shortage areas (HPSA) and non-shortage areas and in different diagnostic subgroups of beneficiaries. Finally, demonstration findings are projected to effects on national Medicare payments if expanded coverage for chiropractic services were extended to all Medicare beneficiaries.

B. Background

The demonstration of expanded coverage for chiropractic services was required by Section 651 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Public Law 108-173). This statute required the Secretary of Health and Human Services to ensure that aggregate payments made under the demonstration did not exceed the amount that would have been paid by Medicare in its absence. CMS subsequently indicated in the *Federal Register* (Volume 70, Number 18, January 28, 2005), that it would assess budget neutrality by determining the changes in Medicare payments based on a pre-post comparison and the rate of change for specific diagnoses that are treated by chiropractors and physicians in the demonstration sites and control sites. CMS specifically stated that it would not limit the analysis to chiropractor claims alone because it was concerned that expanded coverage for chiropractor services might also affect other Medicare costs. To assure budget neutrality, CMS is required to recoup from chiropractors any net increase in Medicare payments that are attributable to the demonstration.

C. Methods

Overview: This analysis of the budget neutrality includes fee-for-service beneficiaries who received Medicare-covered services for principal neuromusculoskeletal (NMS) diagnoses from providers in the demonstration areas during the two-year demonstration period. It calculates the impacts of the demonstration on residents who received care within the demonstration areas and, then, uses national data on in-migration for health care to estimate the effects of “border crossers” (individuals who lived outside the demonstration areas but came within it to receive treatment). The analytical model compares

payments in matched cohorts of beneficiaries who received services in demonstration areas to matched comparison areas. The total cost of the demonstration, therefore, is the product of differences in payments per user and the number of beneficiaries treated in the demonstration areas. Analyses were performed for two distinct populations: (1) all beneficiaries who received any type of service for a principal NMS diagnosis during the demonstration period, whether or not they received chiropractic services; and (2) the subgroup of beneficiaries who received chiropractic services for the treatment of their NMS diagnoses. The all NMS user analysis includes all beneficiaries with NMS diagnoses, and the chiropractic user analysis is limited to those who received chiropractic services. The former reflects an 'intent-to-treat' approach, while the latter is focused on beneficiaries who are most likely to be affected by expanded coverage under the demonstration. The latter approach is less vulnerable to external influences, but may be susceptible to selection effects. The NMS diagnostic codes covered under the demonstration appear in **Appendix B**.

Time Period of the Analysis: The analysis included the year preceding the demonstration (4/1/04 through 3/31/05) and the two years of the demonstration (4/1/05 through 3/31/07). To ensure that late-submitted claims were included, final data requests were fulfilled at least 12 months after the demonstration ended, when datasets are typically at least 99% complete.

Population Studied: The study population includes all fee-for-service Medicare beneficiaries, aged 65 or above or under age 65 with a disability, who were residents of a demonstration area and had at least one Medicare claim from a provider within the demonstration area for a principal NMS diagnosis during the two-year demonstration period. The comparison sample includes similar beneficiaries from matched comparison counties. Beneficiaries who crossed state or county borders to receive NMS services are not included in the analysis directly, but are accounted for as described below.

Border Crossers: The analysis assumes that border-crossing is bidirectional and equal in magnitude between demonstration counties and bordering counties or states. This assumption is based on estimates for Medicare beneficiaries in a 2004 tabulation from CMS' Office of the Actuary that showed net outflows of beneficiaries for medical services in all demonstration states. Though immigration might be encouraged by the financial incentives provided by the demonstration in beneficiaries seeking chiropractic services, the impact of these incentives will be limited by the fact that most beneficiaries have Medicare supplemental insurance policies that are likely to cover expanded chiropractic services and that most were not aware of the demonstration. These factors mitigate any concerns that expanded chiropractic coverage will have differentially attracted beneficiaries into the demonstration areas for treatment. See **Appendix G** for additional discussion of border crossers.

Analytic Approach: Claims for NMS services were summarized for each beneficiary in each model year: the pre-demonstration year and the two years of the demonstration. First, descriptive analyses were performed to assess Medicare reimbursements for all beneficiaries with NMS diagnoses including those who received chiropractic services. In each year, a beneficiary was assigned a cost of \$0 if there were no claims. Following this descriptive analysis, regression analyses were performed to assess demonstration effects, in aggregate and adjusted for patient characteristics and regional differences.

As the first part of the descriptive analyses, the direct effect of the demonstration was calculated as the cost of expanded chiropractic services. This cost was simply the Medicare payments for expanded chiropractic services to chiropractors in demonstration areas during the demonstration period. Since there was no coverage for such services prior to the demonstration, Medicare payments for these services prior to or outside of demonstration areas were automatically zero.

The total impact of the demonstration was based on all Medicare payments, not just those for expanded chiropractic services. Payments were classified by type of service into institutional services (mainly Part A and including hospital inpatient, skilled nursing facility (SNF) and home health agency files) or non-institutional (mainly Part B and including outpatient, physician, and durable medical equipment files). Analyses examined payments by file type, NMS diagnosis category (spine only, spine and extremities, extremities only, and with neurological co-morbidity), state, urban/rural status, and HPSA/non-HPSA status.⁷ The last two analyses were based on urban/rural and HPSA variables assigned at the county level.

Hierarchical linear modeling (HLM) was performed to derive estimates of demonstration effects. This technique is used in situations where one effect is nested inside another. In this study, beneficiaries were nested within groups of counties. The HLM technique takes account of this structure and the resulting correlation among units within the same group (i.e. beneficiaries within the same group of counties). These analyses used key independent variables including age (<65, 65-74, 75-84, 85 or greater), gender, race, urban or rural area, HPSA or non-HPSA area, and adjusted for the clustering of outcomes within the triplet composed of each demonstration county and its two matched comparison counties. Time periods were the year before the demonstration, the two demonstration years, and the interaction between demonstration status and time period. Regressions were performed on total reimbursements and also on subtotals for institutional and non-institutional services.

⁷ Health Professions Shortage Areas (HPSAs) are determined by the Health Services Resource Administration (HRSA) Bureau of Health Professions (<http://bhpr.hrsa.gov/shortage/>).

Regression Models: Annual institutional, non-institutional, and total Medicare reimbursements for each beneficiary with an NMS diagnosis were calculated for each year studied. Then, pre-post demonstration effects were estimated using HLM with beneficiaries nested within triplets of counties (demonstration county and two comparison counties) and three years of data (pre-demonstration year and two demonstration years). The model included individual and county level covariates and time variables (t = post 1 and post 2, with the pre-demonstration time period as the reference category) to adjust for yearly trends. In the models, coefficients for the time variables capture general increases in Medicare reimbursements beyond the demonstration, and interactions between the demonstration indicator and time variables reflect the demonstration effect per beneficiary during each post-year.

The dependent variables in the analytical model are annual Medicare payments during the pre-demo year (y_{pre}) and the two-year demonstration period (y_1 and y_2) for claims with a principal NMS diagnosis for beneficiaries who resided in a demonstration or comparison area. The main outcomes are total Medicare payments for NMS services. To achieve a more complete understanding of cost differences, subtotals were calculated separately for institutional and non-institutional services.

The general form of the model is:

$$y_{i,t} = a_0 + b_1 w_1 + \dots + b_m w_m + c_1 x_1 + \dots + c_n x_n + d_1 t_1 + d_2 t_2 + g_1 \cdot x_1 \cdot t_1 + g_2 \cdot x_1 \cdot t_2 + e_{i,t},$$

where i denotes the Medicare beneficiary, the w_i 's are beneficiary characteristics; x_i 's are characteristics of the county in which the beneficiary resides (including x_1 which indicates participation in the demonstration); t_i are the time period (year) indicators; and the model contains interactions between demonstration status (x_1) with time period indicators (t_1 and t_2). The $e_{i,t}$ term represents the individual random error for each beneficiary, i , in each time period t . The hierarchical nature of the model comes from use of the technique of generalized least squares (GLS) to generate unbiased parameter estimates. The letters a , b , c , d , and g denote fixed coefficients estimated by the model. The key coefficients in the model are the interaction terms, g_1 and g_2 . These coefficients provide estimates of the differential change in cost per demonstration NMS diagnosed Medicare beneficiary (or chiropractic user) in each year during the demonstration period, after controlling for other factors. The g_1 and g_2 coefficients then are the estimated "adjusted pre-post difference-in-difference effects of the demonstration" in years 1 and 2, respectively, in dollars per beneficiary per year, as described in the *Federal Register*.

With respect to budget neutrality, the sign, magnitude, and standard error of the g_1 and g_2 coefficients (for the interaction terms) in the all NMS user analysis are all of interest. They represent the estimated direction, size, and accuracy of the demonstration effect per year for each beneficiary. If the sum of these coefficients is significantly negative, then the budget neutrality conclusion is that demonstration has reduced costs to Medicare, and budget neutrality calculations require no recoup of funds. If g_1 plus g_2 is not significantly different from zero, based on a 95% level of significance, then the analysis would

conclude that the demonstration had no significant impact on Medicare costs and no recoup is indicated. If g_1 plus g_2 is significantly positive, however, the analysis would conclude that the demonstration increased Medicare costs. In this case the demonstration effect must be calculated, as the basis for recouping of funds. Furthermore, if the sum of g_1 plus g_2 is statistically significant, then the total impact of the demonstration on the Medicare budget would be estimated as $(g_1+g_2) \cdot n_{\text{target}}$, where n_{target} is the number of beneficiaries in the target population.

All NMS versus Chiropractic User Analysis: Conceptually, the potential effects of the demonstration fall into several categories. First, expanded coverage allows chiropractors to bill Medicare for allowed services that previously were not delivered, were delivered by other qualified providers, or were delivered by chiropractors but paid by supplemental insurers or “out-of-pocket” by beneficiaries. These are the direct effects of the demonstration on costs. Second, expanded coverage may increase the likelihood that beneficiaries with NMS diagnoses will seek and receive care from chiropractors during the demonstration. Third, the provision of expanded services by chiropractors may substitute for or, alternatively, stimulate additional services by providers other than chiropractors. Fourth, expanded coverage may affect the amount and type of already covered chiropractic services received by a user. The regression analyses give the overall effects of the demonstration on Medicare payments. Subtracting these direct effects from the total costs gives the indirect effects of the demonstration. For the demonstration to be budget neutral, its indirect effects would have to be cost saving (negative) and sufficiently large in magnitude to offset the direct effect on costs.

Both analytic approaches – the **all NMS user analysis** and the **chiropractic user analysis** – account for Medicare payments to chiropractors for expanded coverage of chiropractic services under the demonstration. Both approaches also account for Medicare payments for all NMS-related services received by beneficiaries during the demonstration. The “all NMS” analysis includes all beneficiaries with NMS diagnoses and accounts for changes in the proportion that sees chiropractors at all. Both approaches use the same hierarchical linear model with the same covariates and adjustments for clustering within county. In the chiropractic user analysis, the estimate of demonstration effects per user will be larger than that per beneficiary with NMS. However, if the demonstration were the only major factor influencing Medicare costs, then the two models’ estimates of total demonstration effect (derived by multiplying the cost difference per beneficiary times the number of beneficiaries) would have the same mean and differ only by how much each is affected by external factors, selection issues, and other validity threats.

Alternatives to Per-Person Weighting: Both analytic approaches to calculating demonstration effects on Medicare payments, to this point, are based on per-person effects and population sizes. Using this per person approach, larger population centers, and especially Chicago, heavily weight the results. As a

sensitivity analysis, two alternative weighting schemes were examined **Appendix H**). These were equal weighting for each county that participated in the demonstration and trimmed weights for high population counties. These alternative weights were not used to address the direct effects of the demonstration. They do, however, provide useful additional approaches to estimating indirect effects of the demonstration through possible substitution (or offsets) of services provided by chiropractors in place of services that would have been provided by other physicians, and potential additional services provided by other physicians that were stimulated by the expanded benefits for chiropractors.

National Projections: National cost projections are based on the incremental costs of the demonstration per fee-for-service beneficiary in demonstration areas projected nationally to all Medicare beneficiaries. Projections apply to beneficiaries enrolled in Medicare Advantage under the assumption that cost increases would be passed on to Medicare Advantage plans. The 2005 Area Resource File (2005 ARF) indicates that there were 1,788,187 Medicare beneficiaries in the counties covered by the chiropractic demonstration. The national number of Medicare beneficiaries during the same time period was 22.3 times as large (i.e. 39,875,305). A simple national projection was estimated by multiplying the demonstration effect by this factor. To produce a more accurate estimate, however, demonstration counties were stratified into four categories, based on their urban/rural status and HPSA/non-HPSA classifications, and a weighted national cost projection was calculated.

D. Results

Direct Costs of Expanded Chiropractic Services: Expanded chiropractic services were not reimbursed by Medicare in either demonstration or comparison areas during the pre-demonstration period. In demonstration areas, payments increased to \$15.7 million in the first year of the demonstration and to \$19.1 million in the second year, for a total increase in Medicare payments of \$34.8 million, while remaining at zero in the comparison areas.

All NMS User Analysis: The overall demonstration effect was to increase Medicare payments by \$114 million (**Table 5.1**). This amount was obtained by multiplying the average per NMS beneficiary effect of \$109 by the 1,049,963 beneficiaries with treatments for NMS diagnoses. The results indicate that the demonstration was associated with higher institutional costs (largely inpatient care) as well as substantial increases in non-institutional (largely ambulatory care) costs.

Table 5.1: 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 Million (\$) (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. Standard errors (SE) are in parentheses. 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. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Demonstration Effects by Diagnostic Subgroup: The effects varied considerably among diagnostic subgroups of beneficiaries (**Table 5.2**). Nearly half (44%) of beneficiaries were treated for diagnoses involving both the spine and extremities; followed by diagnoses of the extremities (31%), diagnoses including the neurological system (16%), and diagnosis limited to the spine (8%). The latter was surprisingly low given the fact that traditional Medicare reimbursements for chiropractic services cover only manipulation of the spine. Per-person increments in Medicare payments ranged from \$45 for beneficiaries with only a spine diagnosis to \$140 for those with a neurological problem and \$156 for those with problems of both the spine and extremities. Total demonstration effects on payments varied from approximately \$4 million for beneficiaries with problems limited to the spine to \$72 million for those with both spine and extremity diagnoses.

Table 5.2: Breakdown of Demonstration Effects by Diagnostic Group in the All NMS Analysis

Diagnosis Group	NMS Beneficiaries	Per Person Effect Year 1 (SE)	Per Person Effect Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Million (\$) (SE)
Spine Only	88,254	\$20** (\$8)	\$25** (\$8)	\$45** (\$14)	\$4** (\$1)
Extremities Only	326,024	\$21* (\$9)	\$41** (\$9)	\$63** (\$15)	\$20** (\$5)
Spine and Extremities	464,299	\$60** (\$10)	\$96** (\$10)	\$156** (\$18)	\$72** (\$8)
Including a Neurological Component	171,386	\$64** (\$22)	\$76** (\$22)	\$140** (\$38)	\$24** (\$7)
All NMS Beneficiaries	1,049,963	\$42** (\$7)	\$67** (\$7)	\$109** (\$11)	\$114** (\$12)

Positive numbers indicate higher costs associated with the demonstration. Standard errors (SE) are in parentheses. 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. Statistical significance is indicated by: * ($p < 0.05$) and ** ($p < 0.01$).

Demonstration Effects by Type of Market Area: Table 5.3 shows results by type of market area defined by the combination of HPSA status and urban or rural location. Effects varied greatly by these characteristics. The nearly 80% of beneficiaries who were treated in urban non-HPSA counties (specifically, Illinois) had by far the largest demonstration effect with an increase of \$149 per beneficiary. Also of interest is that the per-beneficiary effect in urban non-HPSA market areas nearly doubled in the second year of the demonstration as compared with its first year. Demonstration effects per beneficiary were small and not statistically significant in urban HPSA counties and rural non-HPSA counties, but showed significant, negative effects in rural HPSA counties (-\$133, $p < .01$), indicating cost savings. All the negative effect in rural HPSA counties was in Year 1 of the demonstration.

Table 5.3: 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 in Million (\$ (SE))
Urban Non-HPSA	779,620	\$55** (\$8)	\$94** (\$8)	\$149** (\$14)	\$116** (\$11)
Urban HPSA	8,979	\$32 (\$50)	(\$46) (\$50)	(\$13) (\$87)	\$0.10 (\$1)
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. Standard errors (SE) are in parentheses. 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. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Demonstration Effects by State: The overall demonstration effect was significantly positive (i.e., increase in costs) due to the large per person effect in Illinois (\$213, p<.01), coupled with the large number of Illinois beneficiaries. Per-person effects were negative in the other four states, with the results being statistically significant in all except Scott County, IA (**Table 5.4**). Chicago and its immediate suburbs were responsible for the overall effect of Illinois as shown in **Table 5.5**. The positive net impact of the demonstration (i.e., increase in costs) was completely due to the \$240 per beneficiary effect of Chicago (t = 13.7, p<.01); while the effect of the other demonstration counties was a negative \$31 (t = 2.1, p<.05).

Table 5.4: 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. Standard errors (SE) are in parentheses. 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. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Table 5.5: Breakdown of Demonstration Effects between the Chicago Area and All Other Demonstration Areas in the All NMS Analysis

Type of Service	NMS Beneficiaries	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Million (\$) (SE)
Chicago and Suburbs	534,431	\$80** (\$10)	\$160** (\$10)	\$240** (\$17)	\$128** (\$9)
Remainder of Demonstration Areas	515,532	(\$2) (\$8)	-\$29** (\$8)	-\$31* (\$15)	-\$16* (\$7)
All NMS Beneficiaries	1,049,963	\$42** (\$7)	\$67** (\$7)	\$109** (\$11)	\$114** (\$12)

Positive numbers indicate higher costs associated with the demonstration. Standard errors (SE) are in parentheses. Separate effects in Year 1 and Year 2 are per beneficiary with an NMS diagnosis.

Table 5.6: Breakdown of 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 Million (\$) (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).

Chiropractic User Analysis: This analysis focuses on the subgroup of 155,086 beneficiaries with NMS diagnoses in the demonstration areas who received chiropractic services. Results parallel those presented previously in the All NMS Analysis. The total impact of the demonstration was \$322 per chiropractic user (**Table 5.6**), as compared with \$109 per person in the analysis of all beneficiaries with NMS diagnoses (**Table 5.1**). This amount included \$287 per person (89%) for non-institutional services and \$35 (11%) for institutional services. The demonstration's total impact was \$50 million compared to \$114 million in the All NMS Analysis. Of this \$50 million, \$45 million was for non-institutional services including the \$34.8 million for the direct costs of expanded chiropractic services.

Table 5.6: Breakdown of 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 Million (\$) (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).

Demonstration Effects by Diagnosis: Chiropractic users have a very different diagnostic breakdown than all NMS users that includes higher proportions of beneficiaries with diagnoses involving the spine and extremities (61% vs. 44%) and spine alone (17% vs. 8%); slightly higher proportions with a neurological diagnosis (21% vs. 16%); and lower proportions with diagnoses of extremities only (1% vs. 31%) (**Table 5.7**). Two-thirds of the total cost increase was accounted for by the spine plus extremities group both because it included 61% of the total population and because of the relatively high per person cost of \$355 per user. The second largest increase in total cost was in beneficiaries being treated for a neurological diagnosis. Especially important with respect to the comparison of the demonstration's effects in chiropractic users and all beneficiaries with NMS diagnoses is the much higher frequency of the treatments for extremities-only problems in the all NMS group (31% vs. 1% in the chiropractic user population).

Table 5.7: Breakdown of the Demonstration Effects by Diagnosis Group in the Chiropractic User Analysis

Type of Service	Chiropractic Users	Effect per User in Year 1 (SE)	Effect per User in Year 2 (SE)	Total Effect per User (SE)	Total Effect in Million \$ (SE)
Spine Only	26,166	\$65** (\$9)	\$75** (\$9)	\$142** (\$16)	\$4** (\$0.40)
Extremities Only	1,712	\$83 (\$125)	\$255* (\$125)	\$339 (\$216)	\$0.60 (\$0.40)
Spine and Extremities	95,174	\$152** (\$20)	\$203** (\$20)	\$355** (\$35)	\$34** (\$3)
Including a Neurological Component	32,034	\$134* (\$55)	\$223** (\$55)	\$357** (\$95)	\$11** (\$3)
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).

Demonstration Effects by Type of Market Area: In chiropractic users, the largest per- person effects were found in urban non-HPSA and rural non-HPSA areas (**Table 5.8**). These results are not substantially different from all NMS analysis (**Table 5.3**). The effects in urban and rural HPSA areas were small and not statistically significant.

Table 5.8: Breakdown of Demonstration Effects by Type of Market Area in the Chiropractic User Analysis

Market Area	Chiropractic Users Served	Effect per User in Year 1 (SE)	Effect per User in Year 2 (SE)	Total Effect per User (SE)	Total Effect in Million \$ (SE)
Urban Non-HPSA	104,797	\$166** (\$20)	\$238** (\$20)	\$404** (\$34)	\$42** (\$4)
Urban HPSA	1,293	-\$78 (\$112)	-\$19 (\$112)	-\$97 (\$195)	\$0.1 (\$0.3)
Rural Non-HPSA	41,437	\$79** (\$29)	\$170** (\$29)	\$249** (\$49)	\$10** (\$2)
Rural HPSA	7,559	-\$45 (\$70)	\$60 (\$70)	\$16 (\$122)	\$0.1 (\$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. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Demonstration Effects by State: The analyses of chiropractic users presented in **Tables 5.9 and 5.10** confirm results of the all NMS analysis and show that Illinois accounts for \$49 million of the total \$50 million increase in Medicare payments and that Chicago and its suburbs alone accounts for 40% of all chiropractic users and 78% of the increase in costs. Costs per chiropractic user increased by \$485 in Illinois and by \$632 in Chicago and its suburbs. Small increases in per person and total costs were found in Maine and Virginia, and small decreases occurred in Iowa and New Mexico, but these changes were not statistically significant. Differences between Illinois and the Chicago area and other demonstration areas were not as dramatic in chiropractic users as they were in all NMS users. For example, **Table 5.10** shows a statistically significant positive effect in demonstration areas outside of Chicago in chiropractic users; while **Table 5.5** shows a small but statistically significant negative effect in all NMS users. This result probably reflects the fact that care for chiropractic users is directly impacted by expanded coverage of chiropractic services, while the effects are diluted in all NMS users because only a small fraction (about 10 percent) of them receive chiropractic services.

Table 5.9: 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. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Summary of Findings and Additional Considerations: The overall effect of the demonstration was to increase Medicare costs by \$114 million in the analysis of all NMS users and by \$50 million in the analysis limited to users of chiropractic services. **Table 5.11** provides a breakdown of these total costs by type of service. The costs of expanded chiropractic services were \$34.8 million in both analyses; while increases in costs for other types of medical services varied widely from \$79.2 million in the all NMS analysis to \$15.2 million in the chiropractic user analysis. The increased costs for other types of medical services reflect both institutional costs (e.g. hospitalizations or admissions to skilled nursing facilities) and non-institutional costs (e.g. for ambulatory care by medical physicians or other types of providers). These costs may be effects of the demonstration or may be unrelated to it. Since they are derived from difference-in-difference analyses, they do control for effects that occurred in both demonstration and matched comparison areas, e.g. inflation in Medicare rates.

Table 5.10: Breakdown of Demonstration Effects between the Chicago Area and other Demonstration Areas in the Chiropractic User Analysis

Region	Chiropractic Users	Effect in Year 1 (SE)	Effect in Year 2 (SE)	Total Effect per Person (SE)	Total Effect in Million (\$ (SE))
Chicago and Suburbs	61,396	\$247** (\$27)	\$385** (\$27)	\$632** (\$46)	\$39** (\$3)
Remainder of Demonstration Areas	93,690	\$73** (\$19)	\$65** (\$19)	\$138** (\$33)	\$13** (\$3)
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. Standard errors are in parentheses. Statistical significance is indicated by: * (p<0.05) and ** (p<0.01).

Table 5.11: Demonstration Effects on Medicare Costs Overall and by Type of Service (in Millions of Dollars)

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

Notation: NMS denotes neuromusculoskeletal

The results in **Table 5.11** are based on analyses that count each person in demonstration or comparison areas equally. The results based on alternative weighting schemes are shown in **Appendix H**. These alternatives examined variability in the effects of the demonstration among counties that represent market effects beyond those controlled in the original matching of demonstration to comparison counties. They showed that, although the results varied widely by county, the mean budget impact on the use of other types of medical services by chiropractic users was quite similar to the \$15.2 million cost shown above using per person weighting of results. These results increase confidence in the validity of results shown above for the per-person analysis of chiropractic users.

Projected Costs of Extending Expanded Coverage for Chiropractic Services to All Medicare

Beneficiaries: The cost of a national rollout of Medicare coverage for expanded chiropractic services will

vary according to whether it applies to all beneficiaries with NMS diagnoses or only chiropractic users and also by whether it includes all Medicare payments or only those for chiropractic services. Based on the ratio of national to demonstration area population sizes, the estimated annual costs for a national rollout would be \$1.27 billion based on demonstration effects in all NMS users, \$556 million based on chiropractic users only, and \$468 million in the direct cost for chiropractic services. **Tables 5.12 and 5.13** summarize national cost estimates. Weights are provided by the ratios of the national number of Medicare beneficiaries to numbers in each type of market area within demonstration areas. This weighted analysis gives a national annual cost estimate of \$1.15 billion (SE \$0.106 billion) based on all NMS users and \$582 million (SE \$49 million) based on chiropractic users only.

Table 5.12: National Estimate of Medicare Costs by Market Area in the All NMS Analysis

Market Area	Annual Estimated Effect in Million \$ (SE)	Medicare Beneficiaries in Demo Areas	Medicare Beneficiaries Nationally	Market Area Weights	Estimated Annual Costs for National Coverage in Million \$ (SE)
Urban Non-HPSA	\$58** (\$5)	\$1,346,884	\$26,728,316	\$20	\$1,155** (\$106)
Urban HPSA	\$0.10 (\$0.40)	18,869	450,287	23.9	(\$1) (\$9)
Rural Non-HPSA	\$2 (\$3)	354,907	11,139,005	31.4	\$60 (\$79)
Rural HPSA	-\$3** (\$1)	67,527	1,554,697	23	-\$62** (\$23)
All Beneficiaries	\$57** (\$6)	1,788,187	39,872,305	NA	\$1,151** (\$135)

Positive numbers indicate higher costs associated with the demonstration. Standard errors are in parentheses. 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).

Table 5.13: National Estimate of Medicare Costs by Market Area in the Chiropractic User Analysis

Market Area	Annual Estimated Effects in Millions \$ (SE)	Medicare Beneficiaries within Demo Areas	Medicare Beneficiaries Nationally	Market Area Weights	Estimated Annual Costs for National Coverage in Millions (SE)
Urban Non-HPSA	\$21** (\$2)	\$1,346,884	\$26,728,316	\$20	\$420** (\$35)
Urban HPSA	\$0.1 (\$0.1)	\$18,869	\$450,287	\$24	(\$1) (\$3)
Rural Non-HPSA	\$5** (\$1)	\$354,907	\$11,139,005	\$31	\$162** (\$32)
Rural HPSA	\$0.1 (\$0.5)	\$67,527	\$1,554,697	\$23	\$1 (\$11)
All Beneficiaries	\$25** (\$2)	\$1,788,187	\$39,872,305	NA	\$582** (\$49)

Positive numbers indicate higher costs associated with the demonstration. Standard errors are in parentheses. Standard errors are in parentheses. Components may not add exactly to totals due to rounding. Standard errors are in parentheses. Statistical significance is indicated by: * ($p < 0.05$) and ** ($p < 0.01$).

E. Discussion

Strengths and Weaknesses of the Analysis: The All NMS user and Chiropractic user analyses each provides a useful perspective, and each also has potential advantages and disadvantages. The analysis of all NMS users provides a broader view by including all beneficiaries with the diagnoses that were targeted by the demonstration and are or could be candidates for chiropractic services. Also, it is well-suited to account for unintended consequences of the demonstration, such as the effects of increasing competition between chiropractors and physicians of other disciplines who treat these diagnoses. The all NMS user analysis also guards better against threats to validity caused by differences in the characteristics of chiropractic users between demonstration and matched comparison areas.

Despite these advantages, the all NMS user analysis also has practical limitations. First, it does not control well for the effects of external events and attributes all differences in utilization and costs of services to the chiropractic demonstration. Second, beneficiaries with NMS diagnoses are a heterogeneous group only some of whom are likely to be (or become) chiropractic service users. Third, the heterogeneity of the group also increases the likelihood of changes in the use of health care services that are unlikely to be affected by chiropractors (e.g. SNF, home health services) and, hence, be falsely

attributed to the demonstration. Fourth, the diagnostic mix of all NMS beneficiaries was very different than that of chiropractic users. For example, 31% of the NMS population had diagnoses involving only the extremities compared with only 1% of chiropractic service users. Finally, the geographic distribution of NMS beneficiaries differed from that of chiropractic users. For example, Chicago and its suburbs make up over 50% of all NMS beneficiaries but fewer than 40% of chiropractic users.

Analyses based on chiropractic users also have advantages and disadvantages. First, chiropractic users were more likely to have been directly affected by expanded coverage under the demonstration -- in the types and frequencies of services received and in reduced out-of-pocket costs for these services. Second, cost offsets for the increased use of chiropractic services from resulting reduced use of other types of ambulatory services or reduced hospitalizations were, at least, theoretically possible effects. Third, the focus on chiropractic users limits the potential effects of external events unrelated to the demonstration that may impact beneficiaries with broader spectrums of NMS diagnoses and types of treatment. Analysis based on chiropractic users, however, might miss indirect effects of the demonstration on services provided by other types of physicians in reaction to expanded coverage for chiropractors (i.e. provider efforts to retain levels of business). Finally, selection effects may have occurred in chiropractic users in demonstration areas that were difficult to adjust for and resulted in imperfect matching with those in comparison areas. Though demonstration and comparison areas were matched on important county-level characteristics, matching at the patient level was limited to diagnosis.

In summary, the all NMS user and chiropractic user analysis each has strengths and limitations. The former avoids selection effects by including all beneficiaries who might have been impacted by the demonstration, but also includes many who were not. The chiropractic user analysis, on the other hand, misses potential unintended consequences of the demonstration and any indirect impacts on non-users of chiropractic services. On balance, the chiropractic user analysis appears to be more directly connected to the effects of the demonstration.

F. Conclusions

This analysis of budget neutrality responded to Congress' requirement under Section 651 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Public Law 108-173) that this demonstration of expanded coverage for chiropractic services not increase aggregate Medicare payments and that CMS be required to recoup from chiropractors any net increases that are attributable to the demonstration. Both the all NMS user and chiropractic user analyses conclude that the demonstration increased Medicare payments for expanded chiropractic services by \$34.8 million. The all NMS analysis found that the demonstration's total effect was 3.3 times this direct increase in costs for expanded chiropractic services (\$114.0 vs. \$34.8 million); while the chiropractic user analysis found it was 1.4 times this amount (\$50.0 vs. \$34.8 million). In the all NMS user analysis, more than half of the

total increase in costs was in beneficiaries who were never treated by a chiropractor. Most costs increases attributable to the demonstration were in Illinois and, especially, in the Chicago metropolitan area. In other areas, either small increases or decreases were found.

REFERENCES

Assendelft W, Morton S, Yu E, Suttorp M, Shekelle P. Spinal manipulative therapy for low back pain: A meta-analysis of effectiveness relative to other therapies. *Ann Intern Med* 2003;138(11):871-881.

Bigos S, Bowyer O, Braen G, Brwon K, Deyo R, Haldeman S, et al. Acute lower back problems in adults. Clinical Practice Guidelines No. 14. Rockville, MD:1994. AHCPR publication no. 95-0642.

Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. *NEngJMed*. 1998;339:1021-9.

Gatterman ML ed. Foundations of Chiropractic: Subluxation. St. Louis: Mosby;1995

Kaptchuk TJ, Eisenberg DM. Chiropractic origins, controversies, and contributions. *Arch Intern Med*. 1998;158:2215-24.

Meeker WC, Haldeman S. Chiropractic: A profession at the Crossroads of Mainstream and Alternative Medicine. *Ann Intern Med*. 2002;136:216-227.

National Board of Chiropractic Examiners (NBCE). Job Analysis of Chiropractic. 2005. <http://www.nbce.org/publication/job-analysis.html>. Accessed 29 Apr 2010.

APPENDICES

Appendix A. Federal Register Description of the Demonstration

Appendix B: Expanded Coverage of Chiropractic Services: Diagnostic and Procedure Codes

Appendix C: Interview Guides for Chiropractic Associations, Practicing Chiropractors, and Medicare Part B Carriers: Initial and Follow-up Interviews

Appendix D: Dates and Locations of Interviews Conducted During Implementation of the Demonstration

Appendix E: Survey of Medicare Beneficiaries Who Are Using Chiropractic Services

Appendix F: Demonstration and Matched Comparison Counties

Appendix G. Technical Note on Border Crossing

Appendix H. Effects of the Demonstration on Medicare Costs Using Alternatives to Per-Person Weighting

Appendix A. Federal Register Description of the Demonstration

[Federal Register: January 28, 2005 (Volume 70, Number 18)]
[Notices]
[Page 4130-4132]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr28ja05-84]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Medicare & Medicaid Services
[CMS-5037-N]

Medicare Program; Demonstration of Coverage of Chiropractic
Services Under Medicare

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Notice.

SUMMARY: This notice announces the implementation of a demonstration mandated under Section 651 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Pub. L. 108-173), which will expand coverage of chiropractic services under Medicare beyond the current coverage for manipulation to correct a neuromusculoskeletal condition. Chiropractors will be permitted to bill Medicare for 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 will be conducted in four sites, two urban and two rural; one site in each area type must be a health professional shortage area (HPSA).

Any chiropractor that provides services in these geographic areas will be able to participate in the demonstration. Any beneficiary enrolled under Medicare Part B, and served by chiropractors practicing in these sites would be eligible to receive services. Physician approval would not be required for these services. The statute requires that the demonstration be budget neutral. We anticipate that the demonstration will begin in April 2005 and operate for two years.

ADDRESSES:

1. By Mail: Written inquiries regarding this demonstration must be submitted by mail to the following address:

[[Page 4131]]

Centers for Medicare & Medicaid Services, Attn: Sidney Trieger,
Division of Health Promotion and Disease Prevention Demonstrations,
Office of Research, Development, and Information, Centers for Medicare
& Medicaid Services, S3-02-01, 7500 Security Boulevard, Baltimore,
Maryland 21244-1850.

Please allow sufficient time for mailed information to be received in a timely manner in the event of delivery delays.

2. E-mail: Inquiries may be sent to the following e-mail address:

MMA_section_651@cms.hhs.gov.

FOR FURTHER INFORMATION CONTACT: Julie Jones, (410) 786-3039 or Sidney Trieger, (410) 786-6613.

SUPPLEMENTARY INFORMATION:

I. Background

Section 651 of the Medicare Prescription Drug, Improvement and Modernization Act of 2003 (MMA) (Pub. L. 108-173) provides for a two-year demonstration to evaluate the feasibility and advisability of covering chiropractic services under Medicare. These services extend beyond the current coverage for manipulation to correct neuromusculoskeletal conditions typical among eligible beneficiaries, and would cover diagnostic and other services that a chiropractor is legally authorized to perform by the State or jurisdiction in which the treatment is provided. Physician approval would not be required for these services. The demonstration must be budget neutral and will be conducted in four sites, two rural and two urban; one site of each area type must be a health professional shortage area (HPSA).

Current Medicare coverage for chiropractic care is limited to manual manipulation of the spine to correct a subluxation, which chiropractors define as a malfunction of the spine. The three currently covered CPT codes are 98940 (manipulative treatment, 1-2 regions of the spine), 98941 (manipulative treatment, 3-4 regions of the spine), and 98942 (manipulative treatment, 5 regions of the spine).

Treatment must be provided for an active subluxation and not for prevention or maintenance. Treatment of the subluxation must be related to a neuromusculoskeletal condition where there is a reasonable expectation of recovery or functional improvement. Chiropractors are required to document the patient's complaint and establish a treatment plan, which includes the expected duration and frequency of treatment, specific goals and measures of effectiveness. This information must be maintained in the medical record and made available to Medicare upon request. Patients do not need a medical physician referral for treatment by a chiropractor under fee-for-service; some Medicare Advantage (MA) plans may require an enrollee to obtain a referral before seeing a chiropractor. In addition, some MA plans do not have chiropractors in their networks and allow osteopaths to provide manipulative services.

II. Provisions of the Notice

A. Covered Services

To determine which services will be covered, we conducted a literature review of the evidence of the effectiveness of chiropractor services. We held discussions with the American Chiropractic Association (ACA) and also reviewed the current coverage of chiropractor services with the Department of Defense and the Veterans Administration. In addition, we convened an Open Door Forum in November 2004 to invite comments on our proposed design for the demonstration. Based on these discussions, the evidence for effectiveness of chiropractic care, and current Medicare policy, the following guidelines for the demonstration were developed:

1. Services must be related to active treatment, not maintenance or prevention. This follows current Medicare coverage for similar services, such as physical therapy. Medicare does not authorize payment for maintenance therapies for other providers. We will require that all claims under the demonstration will have the active therapy (AT) modifier.
2. The demonstration will expand the services chiropractors are allowed to provide in the demonstration only to treatment of neuromusculoskeletal conditions, but not to other conditions. We have found no literature that provides conclusive evidence that chiropractic services are effective for treatment of other diagnoses.
3. Under the demonstration chiropractors can provide plain x-rays, electromyography (EMG) tests and nerve conduction studies; order magnetic resonance imaging (MRI) scans and computed tomography (CT) scans; as well as order or provide laboratory tests (where the applicable State practice act permits chiropractors to provide these services). These diagnostic services are related to the diagnosis and treatment of neuromusculoskeletal conditions. No limits will be imposed on chiropractors for providing diagnostic services, unless limits exist for other providers delivering these services.
4. The demonstration will cover CPT code 98943 for extraspinal manipulation, as it is a recognized procedure for treating neuromusculoskeletal conditions. It will also expand coverage to include other

services chiropractors are legally allowed to provide and Medicare currently covers. These procedures include electrotherapy, ultrasound, transcutaneous electrical nerve stimulation (TENS) therapy, and other services that are medically necessary for the treatment of neuromusculoskeletal conditions. Chiropractors delivering these services will be subject to the same payment policies as other Medicare clinicians currently delivering these services. These requirements can be found in the Medicare Benefit Policy Manual 100-2 in Chapter 15, Sections 220 and 230 and the Medicare Claims Processing Manual 100-4 in Chapter 4, Section 20 and other manual sections. For example, physical and occupational therapy services must be identified through the use of modifiers GP and GO respectively. Chiropractors will also be allowed to make referrals for these therapy services.

5. Chiropractors would also be reimbursed for evaluation and management (E&M) services delivered for neuromusculoskeletal conditions.

Under the demonstration, chiropractors would be allowed to bill Medicare for treatment in addition to an E&M visit on the same day the first time they assess a patient, and thereafter only when they assess a patient for a new, separate problem not currently being treated. The current E&M CPT codes will apply.

We will require chiropractors to submit claims for demonstration services separately from claims for currently covered services (CPT codes 98940, 98941, and 98942). Chiropractors will have to add demonstration code 45 to all demonstration claims in order to be reimbursed for demonstration services.

B. Managed Care Plans

The legislation requires that the same demonstration benefits be offered under MA plans as for Medicare fee for service beneficiaries. Because participation of managed care plans is voluntary, we cannot require plans to participate in the demonstration. We therefore plan to approach MA plans in the demonstration site areas to determine if they would offer demonstration services to beneficiaries, but we will not change the MA plan rates since the demonstration is required to be budget neutral.

C. Payment Rates

The payment rates for demonstration services will be the same as under the physician fee schedule.

D. Budget Neutrality

The statute requires the Secretary to ensure that the aggregate payments made under the Medicare program do not exceed the amount that would have been paid under the Medicare program in the absence of this demonstration.

Ensuring budget neutrality requires that the Secretary develop a strategy for recouping funds should the demonstration result in costs higher than would occur in the absence of the demonstration. We will first determine over the two-year demonstration whether the demonstration was budget neutral. If the demonstration is not budget neutral, we plan to meet the legislative requirements by making adjustments in the national chiropractor fee schedule to recover the costs of the demonstration in excess of the amount estimated to yield budget neutrality. We will assess budget neutrality by determining the change in costs based on a pre-post comparison of costs and the rate of change for specific diagnoses that are treated by chiropractors and physicians in the demonstration sites and control sites. We will not limit our analysis to reviewing only chiropractor claims because the costs of the expanded chiropractor services may have an impact on other Medicare costs.

A CMS evaluation contractor will conduct the analysis of claims and budget neutrality. Since it will take approximately two years to complete the claims analysis, we anticipate that any necessary reduction will be made in the 2010 and 2011 fee schedules. If we determine that the adjustment for budget neutrality would be greater than two percent of the chiropractor fee schedule, we will implement the adjustment over a two-year period. However, if the adjustment is less than two percent of the chiropractor fee schedule, we will implement the adjustment over a one-year period. We will include the detailed analysis of budget neutrality and the proposed offset in the 2009 Federal Register publication of the physician fee schedule.

We invite comments regarding the appropriate methodology for determining budget neutrality. Written materials may be submitted by mail or e-mail to the addresses listed in the ADDRESSES section of this notice.

E. Site Selection

The statute requires that this demonstration be conducted in four sites--two rural and two urban; one site in each type of area must be a health professional shortage area (HPSA). We have selected: 26 northern counties in Illinois which includes Cook, DeKalb, DuPage, Grundy, Kane, Kendall, McHenry, Will, Boone, Bureau, Carroll, Henry, JoDaviess, Kankakee, Lake, LaSalle, Lee, Marshall, Mercer, Ogle, Putnam, Rock Island, Stark, Stephenson, Whiteside, and Winnebago, and Scott county in Iowa (urban);

17 central HPSA counties in Richmond, Charlottesville, Lynchburg, and Danville MSAs in Virginia (urban HPSA)--the Virginia counties include Pittsylvania, Campbell, Appomattox, Nelson, Buckingham, Fluvanna, Louisa, Caroline, Hanover, New Kent, Henrico, Richmond City, Goochland, Cumberland, Powhatan, Amelia and Danville City;

New Mexico (rural HPSA); and
Maine (rural).

We first grouped States by Medicare carriers, because we determined it was important that control and experimental sites should have the same carriers (since some carriers impose limits on chiropractor claims they approve). We then determined appropriate sites based on the following criteria:

Exclude States with restrictive practice regulations.

Exclude States that will not have transitioned to the MCS system in time for the demonstration.

Exclude States that are ranked in the top or bottom 5 values for two or more of the following six statistics:

- Medicare per capita claims costs
- Medicare per capita chiropractic costs
- Per user (patient) chiropractic costs based on carrier data
- Chiropractic service users as a percentage of Part B beneficiaries

- Chiropractors per 10,000 State population
- Chiropractors per 1,000 Part B beneficiaries

Exclude States among those remaining that are served by a unique carrier and, thus, would lack a potential comparison site.

Each carrier group was assessed to determine its ability to support treatment and comparison groups for one or more types of sites.

Data was then used to estimate the number of beneficiaries residing in Urban/Rural and HPSA/non HPSA areas and determine which of the remaining States could support a demonstration site or sites.

Few States had enough beneficiaries residing in HPSAs to be considered for one of the HPSA demonstration sites.

III. Collection of Information Requirements

This document does not impose information collection and record-keeping requirements. Consequently, it does not need to be reviewed by the Office of Management and Budget under the authority of the Paperwork Reduction Act of 1995.

Authority: Section 651 of the Medicare Prescription Drug Improvement and Modernization Act of 2003 (Pub. L. 108-173).

(Catalog of Federal Domestic Assistance Program No. 93.778 and No. 93.774, Medicare--Supplementary Medical Insurance Program)

Dated: December 17, 2004.

Mark B. McClellan,

Appendix B: Expanded Coverage of Chiropractic Services: Diagnostic and Procedure Codes

Diagnostic Codes (ICD-9)

Code	Description	Specific codes within the range
307	Special symptoms	307.81
138	Late effects of poliomyelitis	
340	Multiple sclerosis	
		346.00-.01, 346.10-.11, 346.80- 346.90- 346.20-.21, .81, .91
346	Migraine	
350	Trigeminal neuralgia	350.1, 350.2
352	disorder cranial nerve	352.4 353.0, 353.1, 353.2, 353.4, 353.6
	disorder, nerve root and plexus	
353	Mononeuritis, upper limb and multiple	354.0, 354.1, 354.2, 354.3, 354.4, 354.8, 354.9
354	multiple	355.0, 355.1, 355.2, 355.3, 355.4, 355.5, 355.6, 355.71, 355.79, 355.8, 355.9
355	Mononeuritis, lower limb	
	Neuropathy, hereditary and idiopathic	356.1, 356.4, 356.8, 356.9
356	Neuropathy, hereditary and idiopathic	
358	disorders myoneural	358.00, 358.01
		715.0x, 715.1x, 715.2x, 715.3x, 715.8x, 715.9x
715	Arthritis, osteoarthritis*	
		716.1x, 716.2x, 716.3x, 716.4x, 716.5x, 716.6x, 716.8x, 716.9x
716	Arthropathies, NEC/NOS*	
		717.0-3, 717.40-43, 717.49, 717.5-7, 717.81- 84, 717.85, 717.89, 717.9
717	derangement, knee internal	
		718.0x, 718.1x, 718.6x, 718.8x, 718.9x, 718.48
718	derangement, other joint*	
		719.0x, 719.1x, 719.2x, 719.3x, 719.4x, 719.5x, 719.6x, 719.7, 719.8x, 719.9x
719	disorder, joint NEC/NOS* Spondylitis, ankylosing and other inflammatory	
		720.0, 720.1, 720.2, 720.81, 720.89, 720.9
720	spondylopathies	
	Spondylosis and allied disorders	721.0, 721.1, 721.2, 721.3, 721.41, 721.42, 721.5, 721.6, 721.7, 721.8, 721.90, 721.91 722.0, 722.10-.11, 722.2, 722.30-.32, 722.39-.4, 722.51-.52, 722.6, 722.70-.73, 722.81-.83, 722.91-.93
721	disorders	
		723.0, 723.1, 723.2, 723.3, 723.4, 723.5, 723.6, 723.7, 723.8, 723.9
722	disorder, intervertebral disc	
		724.00-02, 724.1-6, 724.70, 724.71, 724.79, 724.8, 724.9
723	disorder cervical spine	
724	disorders, back NEC/NOS	
725	Polymyalgia rheumatica	
		726.0, 726.10-.12, .19, 726.2, 726.30-.32, .39, 726.4, .5, 726.60-.65, .69, 726.70-.73,.79, 726.8, .90, .91
	enthesopathies, peripheral and allied syndromes	
726	enthesopathies, peripheral and allied syndromes	

		727.00-.06, 727.09,.1, .2, .3, 727.40-.43, 727.49,
727	disorders, synovium tendon and bursa	727.50-.51, 727.59, 727.60-.69, 727.81-.83, 727.89-.9 728.10-.12, 728.2, .3, .4, .5, .6, 728.71, 728.79,
728	disorders, muscle, ligament and fascia	728.81, 728.83, 728.85, 728.87, 728.89, 728.9
729	Other disorders of soft tissues	729.0-.2, 729.5, 729.8-.9
733	Other disorders of bone and cartilage	733.6, 733.92 735.0, 735.1, 735.2, 735.4,
735	deformity, toe acquired	735.5, 735.8, 735.9 736.00-.07, 736.09-.1, 736.20-.22, 736.29-.32, 736.39, 736.41-.42, 736.6,
736	Deformity, limbs acquired	.70-.76, 736.79, 736.81, 736.89 737.0, 737.10, 737.11, 737.12, 737.19, 737.20-22, 737.29, 737.30-34, 737.40-43, 737.8, 737.9
737	Curvature spine	
738	deformity, acquired	738.2-9
739	Lesions, nonallopathic NEC	739.0-9 754.1, 754.2, 754.40-44, 754.50-53, 754.59, 754.60-62, 754.69, 754.70, 754.71, 754.79
754	Congenital musculoskeletal deformities	
756	Other congenital musculoskeletal abnormalities	756.10-15, 756.17, 756.19, 756.2, 756.3, 756.4, 756.82, 756.83, 756.89
840	Sprains and strains of shoulder and upper arm	840.1-9
841	Sprains and strains of elbow and forearm	841.0-.3, 842.00-02, 842.09-13, 842.19
842	Sprains and strains of wrist and hand	
843	Sprains and strains of hip and thigh	843.0, 843.1, 843.8, 843.9
844	Sprains and strains of knee and leg	844.0-844.3, 844.8, 844.9 845.00-03, 845.09-13, 845.19
845	Sprains and strains of ankle and foot	
846	Sprains and strains of the sacroiliac region	846.0-3, 846.8, 846.9
847	Sprains and strains of back NEC/NOS	847.0-4, 847.9
848	Sprains and strains, ill- defined, NEC	848.3, 848.40-42, 848.49, 848.8, 848.9
905	Late effects, musculoskeletal and connective tissues injuries	905.1-9
907	Late effects, injuries to the nervous system	907.0, 907.1-5, 907.9 922.1, 922.31, 922.32, 922.33, 922.8
922	Contusion, trunk	
923	Contusion, upper limb	923.00-03, 923.09-11, 923.20-21, 923.3, 923.8, 923.9

924	Contusion, lower limb	924.00, 924.01, 924.10-11, 924.20-21, 924.3-5, 924.8, 924.9
955	Injury, peripheral nerve(s) of shoulder girdle and upper limb	955.0-9
956	Injury, peripheral nerve(s) of pelvic girdle and lower limb	956.0-5, 956.8, 956.9
958	Certain traumatic complications	958.6
784	Symptoms involving head and neck	784.0

*** = "x" specifies anatomic site, and any value would be appropriate**

Procedure Codes (CPT/HCPCS):

Chiropractic manipulation codes

98943 extraspinal manipulation

Evaluation and Management Codes

99201 New patient 10 minutes
 99202 New patient 20 minutes
 99203 New patient 30 minutes
 99204 New patient 45 minutes
 99205 New patient 60 minutes
 99211 Established patient 5 minutes
 99212 Established patient 10 minutes
 99213 Established patient 15 minutes
 99214 Established patient 25 minutes
 99215 Established patient 40 minutes

Test Codes

95831 Muscle testing, manual w/ report; extremity or trunk
 95832 Hand, with or without comparison with normal side
 95833 Total evaluation of body, excluding hands
 95834 Total evaluation of body, including hands
 95851 Range of motion measurements and report; each extremity or each trunk section
 95852 Hand, with or without comparison with normal side
 95857 Tensilon test for myasthenia gravis
 95858 With electromyographic recording
 95860 Needle electromyography; one extremity with or without related paraspinal areas
 95861 Two extremities with or without related paraspinal areas

 95863 Three extremities with or without related paraspinal areas
 95864 Four extremities with or without related paraspinal areas
 95867 Cranial nerve supplied muscles, unilateral
 95868 Cranial nerve supplied muscles, bilateral
 Nerve conduction, amplitude and latency/velocity study, each nerve; motor, without F-wave
 95900 study

- 95903 Motor, with F-wave study
- 95904 Sensory

Therapy codes

- 64550 Application of surface (transcutaneous) neurostimulator
- 97012 traction, mechanical
- 97018 parafin bath
- 97020 Microwave
- 97024 Diathermy
- 97026 Infrared
- 97028 Ultraviolet
- 97032 electrical stimulation, constant attendance
- 97034 contrast baths
- 97035 Ultrasound
- 97039 unlisted modality
- 97110 therapeutic exercise
- 97112 neuromuscular reeducation
- 97113 aquatic therapy with exercise
- 97116 gait training
- 97124 Massage
- 97139 unlisted therapeutic procedure
- 97140 Manual therapy techniques
- 97150 therapeutic procedures, group
- 97504 orthotic fitting and training

- 97530 Therapeutic activities--dynamic activities to improve functional performance
- 97703 check out for orthotics and prosthetic use

- 97750 physical performance test or measurement, with written report
- 97799 unlisted physical medicine/rehabilitation service

- G0283 unattended electrical stimulation for other than wound care

X rays

- 72010 x-ray spine entire
- 72020 x-ray spine, 1 view
- 72040 x-ray spine cervical 2-3 views
- 72050 x-ray, spine cervical 4+ views
- 72052 x-ray spine cervical complete,
- 72069 x-ray spine standing for thoracolumbar
- 72070 x-ray spine thoracic 2 views

- 72072 x-ray spine thoracic 3 views
- 72074 x-ray, spine thoracic 4+ views
- 72080 x-ray spine thoracolumbar 2 views
- 72090 x-ray spine thoracolumbar supine and standing
- 72100 x-ray spine lumbosacral 2-3 views
- 72110 x-ray spine lumbosacral 4+ views
- 72114 x-ray spine lumbosacral complete

72120 x-ray spine lumbosacral bending only
72170 x-ray pelvis, 1-2 views
72190 x-ray pelvis complete
72200 x-ray sacroiliac joints, up to 3 views
72202 x-sacroiliac joints 3+ views
72220 x-ray sacrum and coccyx 2+ views
73000 x-ray clavicle complete
73010 x-ray scapula complete
73020 x-ray shoulder 1 view
73030 x-ray shoulder 2+ views
73050 x-ray acromioclavicular joint, bilateral
73060 x-ray humerus, 2+ views
73070 x-ray elbow 2 views
73080 x-ray elbow 3+ views
73090 x-ray forearm 2 views
73100 x-ray wrist, 2 views
73110 x-ray wrist, 3+ views
73120 x-ray hand 2 views
73130 x-ray hand 3+ views
73140 x-ray finger(s) 2+ views
73500 x-ray hip unilateral 1 view
73510 x-ray hip unilateral 2+ views
73520 x-ray hip bilateral 2+ views
73550 x-ray femur 2 views
73560 x-ray knee 1-2 views
73562 x-ray knee 3 views
73564 x-ray knee 4+ views
73565 x-ray bilateral knees standing
73590 x-ray tibia fibula 2 views
73600 x-ray ankle 2 views
73610 x-ray ankle 3+ views
73620 x-ray foot, two views
73630 x-ray foot, 3+ views
73650 x-ray heel 2+ views
73660 x-ray toe--2 or more views
71100 x-ray ribs, unilateral; 2 views
71110 x-ray ribs, bilateral 3 views
71120 x-ray sternum, 2+ views
71130 x-ray, sternum+sc joint

Appendix C: Interview Guides for Chiropractic Associations, Practicing Chiropractors, and Medicare Part B Carriers: Initial and Follow-up Interviews

I. Initial Interviews

Interview Guide for Chiropractic Associations

A) Goals of the Demonstration

- What are the main goals of the Demonstration - for chiropractors, for patients, for CMS, for the ACA? How likely is it that these goals will be realized?
- What are their strengths and weaknesses? What midstream changes would be beneficial?

B) Implementation of the Demonstration

- What has gone well?

Probes:

- Diagnoses included
- Services covered
- Billing procedures
- “Incident to” requirements
- Chiropractor receptivity
- Participation rates

- What aspects of the implementation were problematic?

Probes:

- Diagnoses included
- Services covered
- Billing procedures
- “Incident to” requirements
- Chiropractor receptivity
- Participation rates

- What more could have been done to avoid/mitigate problems?
 - by CMS
 - by the carrier
 - by chiropractors
 - by the Chiropractic Association?
- Impacts on practice – patient volume, income, spectrum of services provided

Start-up Period

- When did you hear that ___ had been selected as a Demo region?
- How was information about the Demo disseminated?
- How timely and complete was information?
- Where there adequate opportunities for feedback?
- In retrospect, what changes in implementation plans would have been most useful?

Implementation Period

- How were practicing chiropractors informed about the Demo?
- What roles were played by: a) carriers b) CMS c) ACA d) Chiropractic Association
- What ongoing role has the State Association played in the Demo – educational activities, clearinghouse for complaints, interactions with CMS?
- What have been the reactions to the Demo by practicing chiropractors?
- How many have participated? Why?
- How many have chosen not to participate? Why not?

Results of the Demonstration

- What would be the most positive possible outcome(s)?
- What is (are) the most likely outcomes?

Questions for Practicing Chiropractors

- How did you initially **learn about the Demo**? From whom? What info were you given?
- What was your reaction when you first learned about it?
- Are you **participating** in the Demo? If yes, why? If no, why not?
- What have been the **effects of the Demo** on your practice?
Probes:
 - Practice Patterns
 - Billing issues
 - Ability to attract new patients
 - Broadening the types (diagnoses/clinical problems) of patients
- What aspects of implementation have **gone well**?
Changes over time?
- What aspects of the implementation were **problematic**?
Probes:
 - Billing procedures
 - "Incident to" requirements
 - Impact on practice: patterns/service mixes; income; patient costs/ reactions/ knowledge
- **Participation rates/ reasons** for and for not participating
- Have you attended **educational sessions** aimed at helping you understand billing procedures? If so, by whom or what organization was (were) the session(s) given? How helpful was it (were they)? Have the vendors you use for billing also attended these educational meetings?
- Do you have an **electronic or manual billing** system?
- Have you **changed** your billing system because of the Demo?
- How effective has your Medicare carrier been in helping you with the Demo's billing procedures?
- Do you employ a **chiropractic assistant**? How have you handled billing for services performed by this person in the Demo?
- What changes would you like to see in **coverage for chiropractic services** beyond those provided by the Demo. What could CMS do, at this point, to **improve the Demo** from your point of view?

Questions for Carriers

Involvement and Timing

- At what stage were you informed of the changes you would need to make?
- What changes were required of you to implement the Demonstration?
- What instruction or guidance did you receive to make this easier?
- What went smoothly and what was problematic?
- What might have been done to facilitate the process?

Billing Issues

- Please describe the billing process for the Demo and the issues that were particularly difficult to deal with.
- Why were the denial rates so high during the early months of the Demo?
- Did the chiropractors understand the billing process?
- What role did you have in educating them about the Demo and billing under it?
- What specific steps did you take and what resources did they require?
- Were you adequately reimbursed by Medicare for your efforts in implementing the Demo?

- What changes have you seen over the course of the Demonstration in chiropractor billing practices and error rates?
- What accounts for them?
- What are the most frequent kinds of errors/problems you had at the beginning of the Demo?
- What have they been recently?

Participation Rates

- Had you had much experience working with chiropractors before the Demonstration?
- What are chiropractor participation rates in the Demo now?
- How have they changed over time?
- What has affected these participation rates?
- Do chiropractors who are participating in the Demo seem to be a different group than chiropractors who are not participating but continue to bill Medicare for standard coverage services?

Lessons Learned

- If the Demonstration could be started over, what changes would you like to see in the start-up process; in ongoing procedures?
- If the expanded coverage for chiropractor services is made system-wide, what changes will be needed to make this transition easy?

Additional Questions for Carriers

1. How are the numerators and denominators determined for the calculation of percent total bill in your reports to CMS? Is the numerator the number with a billed 45 service in a given month; an approved 45 bill in the month; a cumulative figure of chiropractors who have ever billed under the Demo; or something else? Is the denominator the number of chiropractors with UPIN numbers for Medicare billing or something different?
2. How frequently are claims rejected by screening procedures before being processed? What happens to these rejected bills?
3. When claims are rejected or denied, what information is given to the chiropractors that will help them to avoid similar errors in the future? Please provide examples for commonly occurring reasons for rejection or denial.
4. In terms of their frequencies, what have been reasons for denials and how have these changed over the course of the demonstration?
5. Billing for E & M services – What are your decision rules for accepting bills for E & M services on repeat visits? Is up-coding of E & M visits a problem? Please describe. How have you dealt with this?
6. One carrier indicated concerns in its 11 month report to CMS over frequent billings for “unattended electrical stimulation” and concern over high volumes of E&M services billed with modifier 25. Are other carriers similarly concerned? Please explain the reasons.
7. How have frequencies of billing for high cost procedures such as MRI and CT scans changed over the course of the demonstration? Do you have any concern that these procedures are being used excessively?

II. Follow-up Interviews

Questions for CMS

- Policy changes in conduct of the Demonstration in the last year
- Changes in procedures with respect to Carriers
- Any carrier issues that have arisen; specific to carrier

- Changes in thinking about the “cost of the Demonstration to Medicare” and the calculation of budget neutrality
- Any other issues or concerns

Questions for ACA

- Feedback from chiropractors and chiropractic associations about the Demonstration (what’s going well, concerns, suggestions for improving it)
- Feedback on survey – issues and ; interactions with chiropractic associations and with chiropractors
- Specific suggestions about the impending Report to Congress
- Any other issues or concerns

Questions for Carriers

1. Billing Issues

- Changes in bill denial rates and their patterns
- Changes in outreach to chiropractors and educational activities
- Customer service issues – chiropractors, Medicare beneficiaries
- Costs of demo participation

2. Chiropractor Participation Rates

- Any participation in Demonstration
- Volume of services billed
- Service mix billed

3. Policy Changes that Affect the Demonstration

- By CMS
- By carrier

4. Any other issues or concerns

Questions for Chiropractors and their Associations

1. Billing for Services under Demonstration

- Participation rates in Demonstration
- Bill denial rates
- Coding, clarifications, and returned bills
- Customer service and support from carriers
- Costs to practice for billings and vendor system support (e.g. double billing requirement for demo and non-demo services)

2. “Incident to’ Issues

- Changes in rules or new adaptations: billing patient, direct service, chiropractic assistants’ roles

3. Effects on Practices

- Practice volume
- Patient mix
- Changes in patterns of care
- Use of diagnostic tests
- Use of treatment procedures
- Net practice income

4. Roles and Relationships with:

- CMS
- Carriers
- ACA

5. Other issues or concerns?

Appendix D: Dates and Locations of Interviews Conducted During Implementation of the Demonstration

Organization	Date(s) of Interviews	Location	Medium	Number of Participants
CMS – Division of Health Promotion and Disease Prevention Demonstrations	11/30/05	Baltimore, MD	Meeting	4
	02/21/07		Conf Call	4
American Chiropractic Association	11/30/05	Arlington, VA	Meeting	9
International Chiropractors Association	07/19/06	Arlington, VA	Telephone	1
Part B Medicare Carriers				
Maine carrier (NHIC)	02/17/06		Conf Call	4
	04/04/07		Conf Call	5
New Mexico carrier (Pinnacle)	02/22/06		Conf Calls	4
	02/24/06		Meeting	3
	03/20/07		Conf Call	7
Illinois Carrier (WPS)	03/17/06		Conf Call	15
	03/24/07		Conf Call	7
Scott County, Iowa Carrier (Noridian)	04/13/06		Conf Call	2
	03/19/07		Conf Call	4
Central Virginia Carrier (Trailblazer)	03/22/06		Conf Call	6
	03/31/07		Conf Call	5
Chiropractic Associations				
Maine Chiropractic Assn	02/23/06	Augusta, ME	Meeting	5
	04/03/07		Conf Call	6
New Mexico Chiropractic Assn. and Chiropractors	05/8-10/06	Albuquerque, NM	Meeting	13
	04/10/07		Conf Call	6
Illinois State Chiropractic Association and Chiropractors	05/10/06	National Univ. Lombard, IL	Meeting	8
	04/10/07		Conf Call	7
Prairie State Chiropractic Association	05/11/06	Moline, IL	Meeting	9
Iowa Chiropractic Assn.	05/12/06	Davenport, IA	Meeting	8
	03/27/07		Conf Call	6

Central Virginia Chiropractic Assn.	04/13/06 03/27/07		Conf. Call Conf Call	5 6
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Appendix E: Survey of Medicare Beneficiaries Who Are Using Chiropractic Services

OMB #: 0938-0998

Expiration Date: 10/31/2009

Medicare's Demonstration to Examine Expanded Insurance Coverage for Chiropractic Services

Survey of Medicare Beneficiaries Who Are Using Chiropractic Services

This survey aims to learn about your use of health care services from chiropractors and how these have helped you.

Please answer all questions as honestly and completely as you can by checking a box or filling in a response.

Your responses will be kept strictly confidential.

Thank you very much for participating!

Conducted by: **Centers for Public Health Research and Evaluation**

Conducted for: **Brandeis University**

January 2006

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0998. The time required to complete this information collection is estimated to average 20 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to: CMS, 7500 Security Boulevard, Attn: PRA Reports Clearance Officer, Mail Stop C4-26-05, Baltimore, Maryland 21244-1850.

Survey of Users of Chiropractic Services Page 1

Section A: Health Problems or Symptoms Treated by a Chiropractor during the Past 12 Months

A1. What types of problems or symptoms caused you to seek care from a chiropractor during the **past 12 months**? Please check all that apply and **circle your single worst problem**.

- Pain
- Stiffness
- Difficulty walking
- Difficulty doing daily tasks
- Loss of balance
- Headache
- Other (Please specify): _____

A2. What part(s) of your body does your single worst problem involve (problem circled in # A1)? Please check all that apply.

- Head
- Neck
- Back
- Shoulder

- Arm
- Elbow
- Wrist or hand
- Hip
- Upper leg (thigh)
- Knee
- Ankle or foot

Section B: Treatment of Your “Worst” Problem

In this section, please focus only on the problem you indicated above was the worst problem or symptom for which you have received care from a chiropractor during the past 12 months

B1. Overall, how long had you had this problem?

- Less than 2 months
- 2 to 6 months
- 7 to 12 months
- More than 1 to 2 years
- More than 2 years

B2. Were you treated for this problem by another physician or other health professional before you went to a chiropractor?

- Yes
- No **Skip to B5.**

Survey of Users of Chiropractic Services Page 2

B3. What kind(s) of treatment did you receive from this physician or other health professionals? Do not include a referral to a chiropractor as an answer. Please check all that apply.

- Prescribed pills for pain
- Over-the-counter pills for pain
- Injections for pain
- Other types of prescribed pills
- Physical therapy
- Surgery
- Other (Please specify): _____

B4. How much did this (or these) treatment(s) from a physician or other health professional help to relieve your symptoms? Please circle only one number.

- | | | |
|------------------|-----------------|-----------------|
| No relief at all | Moderate Relief | Complete Relief |
| 1 | 2 | 3 |
| 4 | 5 | |

B5. How long ago did you **first seek care** for this problem from a **chiropractor**?

- Less than 2 months ago
- 2 to 6 months ago
- 7 to 12 months ago
- More than 1 to 2 years ago
- More than 2 years ago

B6. How severe were your symptoms when you first went to a chiropractor? Please circle only one number.

No symptoms		Moderately severe symptoms		Very severe symptoms
1	2	3	4	5

B7. At that time, how much did these symptoms interfere with your usual activities?

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

Survey of Users of Chiropractic Services Page 3

B8. What kinds of treatments have you received from the chiropractor during the **past 12 months**? Please check all that apply.

- Manipulation
- Electrical stimulation
- Traction
- Heat
- Massage
- Exercises
- Other (Please specify): _____

B9. How much have the chiropractic treatments helped to relieve the symptoms from the “worst problem” you identified above?

No relief		Moderate Relief		Complete Relief
1	2	3	4	5

If B9 = “Complete Relief,” skip to B11.

B10. How much do these symptoms interfere with your usual activities now?

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

B11. All together, how many visits have you made to the chiropractor during the **past 12 months**?

- 1 visit
- 2-3 visits
- 4-6 visits
- 7-12 visits
- 13 or more visits

B12. During the time you have been receiving treatments for your symptoms from your chiropractor, have you also continued to receive treatments **for this same problem** from other physicians or health professionals?

- Yes
- No

Survey of Users of Chiropractic Services Page 4

Section C: Satisfaction with Chiropractic Services

C1. Why did you choose to seek treatment from your chiropractor? Please check all that apply.

- I have been treated by a chiropractor for problems in the past.
 - I was not getting relief of my problem from other physicians or health professionals.
 - My medical doctors referred me.
 - A friend or family members recommended that I seek care from a chiropractor.
 - The chiropractor was easier to get appointments with.
 - Care from chiropractors was less expensive.
 - Other (Please specify): _____
-

C2. On average, how long do you have to wait to get an appointment with your chiropractor?

- Next day
- Within one week
- Within one month
- More than one month

C3. How often does your chiropractor listen carefully to you?

- Never
- Sometimes
- Usually
- Always

C4. How often does your chiropractor spend enough time with you in the office?

- Never
- Sometimes
- Usually
- Always

C5. Please rate the quality of services you have received from your chiropractor. Using any number from 0 to 10, where 0 is worst possible services and 10 is the best services, how would you rate the services you have received from your chiropractor?

Worst Best

0 1 2 3 4 5 6 7 8 9 10

Survey of Users of Chiropractic Services Page 5

Section D: Your General Health and Daily Activities

D1. In general, would you say your health is:

- Excellent
- Very good
- Good
- Fair
- Poor

D2. Do you have any other medical problems that have required treatment by physicians or other health professionals during the past 12 months? Please check all problems for which you have received treatment.

- Hypertension (high blood pressure)
- Heart attack or myocardial infarction
- Congestive heart failure
- Other heart conditions
- Asthma or other lung problem
- Diabetes
- Stomach ulcer or bowel disease
- Arthritis
- Stroke
- Cancer
- Depression
- Stress or anxiety
- Other (Please specify): _____

Section E: Health Insurance and Out-of-Pocket Expenses

E1. Do you currently have other kinds of insurance in addition to Medicare?

- Yes
- No

If No, **Skip to E2.**

If Yes: Please check the kinds of insurance you have.

- The Veterans Administration (VA)
- Private insurance
- Blue Cross Blue Shield
- Medicaid
- Other (Please specify): _____

Survey of Users of Chiropractic Services Page 6

B. Which of these insurance policies pay for the services you have received from a chiropractor?

Please check all that apply.

- Medicare
- The Veterans Administration (VA)
- Private insurance
- Blue Cross Blue Shield
- Medicaid
- Other (Please specify): _____

E2. How long ago did you **first** receive treatment by a chiropractor for any medical problem?

- Within the last 12 months
- 1 to 2 years ago
- 2 to 5 years ago
- More than 5 years ago

E3. For the chiropractic services you received in the past 12 months, how important was insurance coverage to your decision?

- Not at all important
- A little important
- Moderately important
- Very important
- Extremely important

E4. During the past 12 months, what was your average out-of-pocket cost for a visit to a chiropractor?

Average amount paid for one chiropractic visit . _____ \$

E5. Before you received this survey, were you aware that Medicare had increased insurance coverage for chiropractic services in your area?

- Yes
- No

If No, **Skip to F1.**

A. How did you learn about it?

- Newspaper
- TV
- Mailed ads
- From friends
- From my chiropractor
- From my medical physician
- Updated Medicare benefits booklet
- Other (Please specify): _____

Survey of Users of Chiropractic Services Page 7

B. For what chiropractic services has increased insurance coverage been especially important to you?

Please check all services that are important to you.

- Treatment for problems or diagnoses that were not covered before
- X-rays
- MRI or "CT" (cat) scans
- Manipulation
- Electrical stimulation
- Traction
- Heat treatments
- Massage
- Blood tests
- Other (Please specify): _____
- Not sure what services are covered

Section F: Personal Characteristics

F1. Are you male or female? Male Female

F2. Are you of Hispanic or Spanish family background? Yes No

F3. How would you describe your race? Please check all that apply.

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or other Pacific Islander
- White

F4. What is your current marital status?

- Married or living with someone as if you were married
- Divorced
- Separated
- Widowed
- Never married

F5. With whom do you live?

- Live alone
- Live with another/others

Survey of Users of Chiropractic Services Page 8

F6. What is the highest grade or level of school that you have completed?

- 8th grade or less
- Some high school, but did not graduate
- High school graduate or GED
- Some college or 2 year degree
- 4-year college graduate
- More than a 4-year college degree

Thank you for participating in our study!

Please place this survey in the self-addressed, stamped envelope provided and drop in a mail box.

Appendix F: Demonstration and Matched Comparison Counties

Market Area	Demonstration State	Demonstration County	Matched State	Matched County
Rural HPSA	IL	CARROLL	MI	PRESQUE ISLE
	NM	CATRON	AR	NEWTON
	NM	CHAVES	AR	CROSS
	NM	CIBOLA	LA	ACADIA
	NM	DE BACA	AR	PRAIRIE
	NM	EDDY	OK	NOWATA
	NM	GUADALUPE	OK	OKFUSKEE
	NM	HARDING	AR	MARION
	NM	HIDALGO	AR	CLEVELAND
	NM	MCKINLEY	OK	ATOKA
	NM	MORA	AR	SCOTT
	NM	QUAY	AR	MONTGOMERY
	NM	SAN JUAN	AR	SAINT FRANCIS
	NM	SIERRA	AR	SEARCY
	NM	SOCORRO	OK	HUGHES
	NM	UNION	OK	COTTON
	VA	APPOMATTOX	TX	MARION
	VA	BUCKINGHAM	VA	BRUNSWICK
	VA	FLUVANNA	TX	LIPSCOMB
	VA	NELSON	VA	SCOTT
Rural Non-HSPA	IL	BUREAU	MN	CHIPPEWA
	IL	JO DAVIESS	WI	WAUPACA
	IL	KANKAKEE	MI	CALHOUN
	IL	LA SALLE	WI	MANITOWOC
	IL	LEE	WI	BUFFALO
	IL	OGLE	MN	DOUGLAS
	IL	PUTNAM	MN	NOBLES
	IL	STEPHENSON	MN	WATONWAN
	IL	WHITESIDE	WI	ONEIDA
	ME	ANDROSCOGGIN	NH	BELKNAP
	ME	AROOSTOOK	MA	BERKSHIRE
	ME	FRANKLIN	VT	RUTLAND
	ME	HANCOCK	NH	SULLIVAN
	ME	KENNEBEC	VT	WASHINGTON
	ME	KNOX	NH	CHESHIRE
	ME	LINCOLN	VT	BENNINGTON
	ME	OXFORD	VT	WINDHAM
	ME	PENOBSCOT	VT	GRAND ISLE
	ME	PISCATAQUIS	NH	GRAFTON
	ME	SOMERSET	VT	CALEDONIA
	ME	WALDO	VT	ORLEANS
	ME	WASHINGTON	VT	WINDSOR
	NM	COLFAX	OK	BEAVER
	NM	CURRY	OK	MAYES
	NM	DONA ANA	AR	JEFFERSON
	NM	GRANT	OK	MURRAY

Appendix F: Demonstration and Matched Comparison Counties (Continued)

Market Area	Demonstration State	Demonstration County	Matched State	Matched County
	NM	LEA	LA	LAFOURCHE
	NM	LINCOLN	OK	DELAWARE
	NM	LOS ALAMOS	OK	BECKHAM
	NM	LUNA	AR	CLAY
	NM	OTERO	AR	POPE
	NM	RIO ARRIBA	AR	LEE
	NM	ROOSEVELT	OK	BLAINE
	NM	SAN MIGUEL	OK	ADAIR
	NM	SANTA FE	OK	PAYNE
	NM	TAOS	OK	CHEROKEE
	VA	CAMPBELL	TX	HOUSTON
	VA	DANVILLE CITY	VA	MARTINSVILLE CITY
	VA	PITTSYLVANIA	TX	MCLENNAN
Urban HPSA	IL	STARK	IL	MACOUPIN
	NM	TORRANCE	LA	EAST FELICIANA
	NM	VALENCIA	LA	SAINT CHARLES
	VA	AMELIA	TX	SAN JACINTO
	VA	CAROLINE	TX	SAN PATRICIO
	VA	NEW KENT	TX	BASTROP
Urban Non-HPSA	IA	SCOTT	IA	DALLAS
	IL	BOONE	WI	PIERCE
	IL	COOK	WI	MILWAUKEE
	IL	DE KALB	WI	OZAUKEE
	IL	DU PAGE	MN	ANOKA
	IL	GRUNDY	WI	BROWN
	IL	HENRY	IL	JERSEY
	IL	KANE	WI	DANE
	IL	KENDALL	MN	SHERBURNE
	IL	LAKE	MN	HENNEPIN
	IL	MARSHALL	MI	CASS
	IL	MCHENRY	MN	WRIGHT
	IL	MERCER	WI	KEWAUNEE
	IL	ROCK ISLAND	IL	MONROE
	IL	WILL	MI	OAKLAND
	IL	WINNEBEGO	IL	PEORIA
	ME	CUMBERLAND	MA	PLYMOUTH
	ME	SAGADAHOC	MA	BRISTOL
	ME	YORK	MA	HAMPSHIRE
	NM	BERNALILLO	AR	PULASKI
	NM	SANDOVAL	AR	CRITTENDEN
	VA	GOOCHLAND	VA	YORK
	VA	HENRICO	VA	GLOUCESTER
	VA	LOUISA	TX	NUECES
	VA	POWHATAN	TX	WILLIAMSON
	VA	RICHMOND CITY	VA	SUFFOLK CITY

Appendix G: Technical Note on Border Crossing

The analysis assumes that individuals who cross borders to receive health care services are representative of all beneficiaries with NMS diagnoses and that border-crossing is bidirectional and equal in magnitude. Net migration was estimated using a 2004 report from CMS' Office of the Actuary that examined state-specific health expenditures based on state of provider and state of beneficiary residence. These results provide the important perspective of net crossing for large areas (e.g., states or large groups of adjacent counties). **Table G.1** shows an abridged version of results for the demonstration states. While these data concern all medical services for Medicare beneficiaries, they should be representative, since NMS-diagnosed beneficiaries represent over 55% of all beneficiaries in the demonstration states. The table shows values of 100% or greater for each demonstration state indicating net outflow of beneficiaries for medical services. Hence, results in this report are conservative in assuming zero net border-crossing for beneficiaries in demonstration states.

In the case of the subgroup of NMS-beneficiaries who receive chiropractic services, a net positive inflow into demonstration areas might be expected due to the financial incentives provided by expanded coverage and resultant reductions of out-of pocket costs for beneficiaries. The impact of such incentives, however, is likely to be limited by several factors. First, most beneficiaries already have Medicare supplemental insurance.⁸ The survey of beneficiaries reported in Chapter III of this project report found that about 70% of Medicare beneficiaries who were chiropractic users reported private insurance coverage for chiropractic services; and more comprehensive policies are likely to cover expanded chiropractic services. Second, out-of-area beneficiaries may not have heard of the expanded chiropractic coverage or, even if they had, would have to travel further and change their chiropractic providers to take advantage of it. Third, the defined population of chiropractic service users included both beneficiaries who used only services that are traditionally reimbursed by Medicare and those who used expanded chiropractic services. Together, these factors mitigate potential concerns that expanded chiropractic coverage attracted beneficiaries into the demonstration areas for treatment.

⁸ Centers for Medicare & Medicaid Services. Current trends in MCBS, 2002. <http://www.cms.hhs.gov/mcbs/downloads/HHC2003chapter2.pdf>. Accessed 25 Feb 2009

Table G.1. Net Flow Ratios of Medicare Personal Health Care Expenditures to Residents of Each Demo State by Type of Service, Region, and State of Residence: Calendar Year 2004*

Region and State of Residence	Total	Hospital Care	Physician & Clinical Services	Other Professional Services
Maine	103%	103%	105%	101%
Illinois	105%	106%	105%	103%
Iowa	106%	107%	106%	103%
Virginia	102%	103%	102%	103%
New Mexico	109%	111%	110%	103%
Average, demo states	105%	106%	106%	103%
United States	100%	100%	100%	100%

SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group.

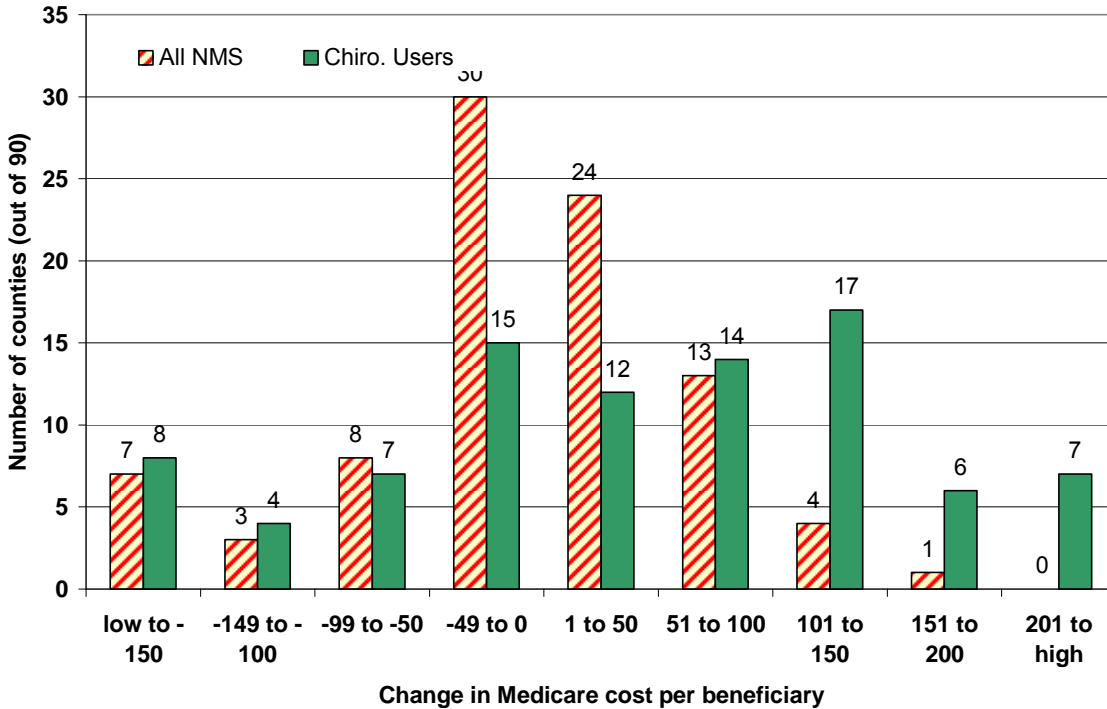
*Expenditures by State of residence divided by expenditures by state of provider. Ratios greater than 100% mean that residents consume more health care than the state produces; ratios less than 100% mean that the state produces more health care than its residents consume. Additional hospital-based service expenditures of this type are included with hospital services.

Appendix H: Effects of the Demonstration on Medicare Costs Using Alternatives to Per-Person Weighting

The main estimates of the demonstration's effects on Medicare payments were based on per-person effects and population sizes. Using this approach, larger population centers, and especially Chicago, heavily weight the results. In this appendix, alternative weighting schemes are examined, including equal weighting for each county and trimmed weights for high population counties. This appendix does not address the direct Medicare payments paid to chiropractors for expanded services under the demonstration. Rather, it addresses indirect costs related to possible substitution (or offsets) of services provided by chiropractors in place of services that would have been provided by other physicians, and potential additional services provided by other physicians that were stimulated by the expanded benefits for chiropractors.

A total of 92 counties in the five demonstration areas participated in the demonstration. **Figure H1** displays demonstration effects per beneficiary for 90 of these 92 counties. Solid bars refer to chiropractic service users, and cross-hatched bars refer to all NMS users. Two counties with outlier averages at extreme ends of the distribution were omitted to allow for a legible display of detail. The bars for all NMS users show a fairly symmetrical distribution of counties with positive or negative effects on costs per beneficiary with the mode showing a small decrease in total Medicare costs per beneficiary. Data for chiropractic users show more consistent increases in costs. Even among chiropractic users, however, a substantial proportion of counties (34 of 90) showed net negative effects on costs during the demonstration.

Figure H1: Histogram of Demonstration Effects by County under All NMS and Chiro User Analyses *



* The horizontal axis is the net cost per person with an NMS diagnosis aggregated over 2 years. Results are aggregated into categories with a width of \$50 per person. The vertical axis is the number of demonstration counties in that category.

Three different weighting schemes for county level analyses of the demonstration’s effects on costs are shown in **Table H1**: weights by population size (i.e.) equal weight per beneficiary; equal weight per beneficiary with trimming for high population counties; and equal weights per county. These weighting schemes lead to striking differences in cost estimates in the **all NMS** analysis from \$79.2 million if counties are weighted by population size to \$14.7 million if they are equally weighted. Differences for the **chiropractic user** analysis vary much less, from \$15.2 million to \$12.1 million. This contrast suggests that the additional costs in the All NMS Analysis were due to extreme results in a few highly populated counties and may not be representative of the true effects of expanded chiropractic benefits. The tight clustering of effects in the chiropractic analysis, on the other hand, suggests a more reliable estimate of true effects.

Table H.1: Demonstration Effects on Costs by Type of County Weighting (Millions of Dollars)

Type of Analysis	Counties weighted by population size	Weights trimmed in high population counties	Counties equally weighted
All NMS Analysis	\$79	\$65	\$15
Chiropractic User Analysis	\$15	\$13	\$12

Notation: NMS denotes neuromusculoskeletal