



Geographic Access to Treatment for VHA Patients with Multiple Sclerosis

MSCoE-West

MANAGEMENT REPORT

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Geographic Access to Treatment for VHA Patients with Multiple Sclerosis:

MSCoE-West

Research Support

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I. OVERVIEW

Background/Rationale

The Multiple Sclerosis Centers of Excellence (MSCoE) was established in 2003. The Baltimore VAMC (MS CoE-East) and Seattle-Portland VAMCs (MSCoE-West) were selected as the coordinating sites for this program. A major goal of the MSCoE is to improve the quality of and access to MS specialty care for veterans diagnosed with MS. Currently there are about 37,000 veterans (VHA MS User Cohort) that are seen in the VHA for MS-related issues (e.g., rule-out, diagnostic evaluation, treatment, etc.) and about 19,000 with a confirmed diagnosis (VHA MS Patient Cohort).

Probably the most basic benchmark for assessing access to MS specialty care is the proportion of veterans with MS that are seen by an MS specialist at least once a year. Because MS is a complex, chronic, degenerative disease, MS-specialty care is critical for assessment of quality of care in MS. The National MS Society (NMSS) recently has endorsed 17 MS-specific quality indicators¹, one of which is an annual MS-specialty visit.

Preliminary analysis revealed that only 51.5% of the VHA Patient cohort (nationwide) received an annual MS-specialty visit during the period of FY1998 through FY2006.² An MS-specialty visit was defined as an outpatient encounter where MS was listed as the primary diagnosis that occurred in a neurology clinic, SCI clinic, or physical medicine. This method provided a crude estimate of annual MS-specialty visits as a complete list of VHA facilities nationwide with MS specialty care is now being compiled. Thus, these preliminary estimates are likely an overestimate of the real rate.

The present study was designed to establish travel bands to the nearest VHA facility with MS-specialty care in veterans with MS (MS Patient Cohort) and to provide an empirical method for testing placement of MS-specialty care in currently underserved areas. Additionally, these data will be used in future projects to assess the impact of travel times on receiving annual MS-specialty visits.

Objectives

Objective 1: To identify veterans from the VA Multiple Sclerosis Patient Cohort who accessed Veterans Health Administration (VHA) facilities for treatment of MS.

Objective 2: To use Geographic Information System (GIS) tools to ascertain veterans' access to treatment and medical services offered to veterans with MS within the MSCoE-West catchment area.

Objective 3: To demonstrate the utility of using GIS tools in decision-making by providing three VISN-level examples of how patients' access to care is affected when adding additional MS specialty clinics.

¹ RTI International. Multiple Sclerosis quality indicators project. RTI project No. 08536.002. National Multiple Sclerosis Society, 2004.

² Culpepper WJ. MS quality indicators: MS-specialty visit (MSSV) preliminary findings. Presented at the annual MS CoE-East Directors & Coordinators meeting. September, 2007.

Methods

Data sources: The VHA MS Patient Cohort is derived from VHA extant databases and contains 19,311 veterans whose MS diagnosis has been confirmed through application of a statistical algorithm.³ These data contain patient characteristics that include home ZIP code, utilization by type of care (inpatient, outpatient), location of care (hospital unit, clinic stop codes), diagnosis and procedure codes, healthcare costs as well as home facility and its ZIP code. The focus in this report is the 9,415 patients within the MS CoE-West catchment area (Figure 1).

Study design: This is a retrospective, observational study of all MS patients currently seeking treatment in VHA facilities within the MS CoE-West network during FY2007. This is a descriptive study that lays the foundation for additional research.

Analysis Plan: In this study, we define veterans' access as travel time (in minutes) to VA health care facilities (Figure 2). Using GIS mapping tools (ArcGIS), the location of patients in relation to MS specialty care are displayed across Veterans Integrated Service Network (VISN). From the administrative data, patients' state, county, and ZIP code of residence were obtained. The Assistant Deputy Under Secretary for Policy and Planning maintains a database on all VA facilities called the VA Site Tracking System (VAST). This database includes the street address of the facility, along with the site latitude and longitude.

Procedures: The VHA Planning System Support Group has created 30, 60, 90, and 120 minute travel time bands around each VA facility. It is important to use travel time as an indicator of geographic access, as straight-line distance is dependent on population density and ease of traveling. For example, a 15 mile distance to a VA facility in rural Nebraska may take a commuting time of 15 minutes, while the same 15 mile distance may take an hour or more in a heavily urbanized area such as Chicago or New York. The methodology used for creating the travel time bands takes into account population density and type of roadways. In addition to displaying current patient-to-facility patterns, three "what if?" scenarios are included to demonstrate the utility of GIS tools for decision-making. Specifically, the change in MS patients' access to specialty care is calculated when adding MS specialty clinics in VISN 15 (Kansas City), VISN 16 (Houston) and VISN 18 (Albuquerque).

Results

The availability of and accessibility to MS specialty care varies widely across VISNs within the MS CoE-West catchment area (Figures 3-12). Almost half of MS patients in the total catchment area (VISN 12 – VISN 23) travel more than two hours to specialty MS care (45.9%)(Table 1). Access to MS specialty care appears poorest in VISN 15 where only 2.6% of MS patients are within 30 minutes and 70.4% of MS patients in this VISN reside more than a two hour travel time to a MS specialty site. Other VISNs where more than half of patients travel more than two hours to MS specialty care include: VISN 18 (65.5%), VISN 16 (56.6%), and VISN 23 (56.2%). VISN 12 and VISN 17 show greater relative accessibility to specialty care for MS patients than other VISNs in the MS CoE-West catchment area.

To show how this GIS mapping technique could be used for policy and planning purposes, we selected VISNs 15, 16, and 18 as test cases because they had the largest percentage of patients traveling more than 2-hours to the nearest facility with MS-specialty care. Based on visual inspection of the VISN-specific maps we asked: what would happen to the travel bands if

³ Culpepper WJ, Ehrmantraut M, Wallin MT, Flannery K, Bradham DD. Identification of the VHA MS Surveillance Registry: the problem of case-finding from administrative databases. *Journal of Rehabilitation Research & Development*. 2006; 43(1): 17-24.

there was an MS-specialty clinic located at an additional facility within those VISNs? In VISN 15, if a MS-specialty clinic was placed at the Kansas City VAMC (compare Figures 4 and 13) the proportion of patients traveling more than 2-hours would be decreased from 70.4% to 40.8%. Similarly, if an MS-specialty clinic was placed at the Houston VAMC (compare Figures 5 and 14), the proportion traveling more than 2-hours in VISN 16 would be decreased from 56.6% to 39.8%, and if a MS-Specialty Clinic was placed at the Albuquerque VAMC the proportion traveling more than 2-hours in VISN 18 would be decreased from 65.5% to 50.1% (compare Figures 7 and 15). Other facility locations within a given VISN can be similarly evaluated to determine which additional facility results in the largest reduction in the proportion of veterans traveling more than 2-hours for MS-specialty care.

In summary, GIS mapping techniques provide a powerful and valuable tool for policy and planning personnel when evaluating how to address underserved populations and areas within the VHA healthcare system.

Impact

This study contributes to health services research evidence base by using an existing database together with sophisticated GIS mapping techniques to develop a method to assess geographic variability in access to specialty care for MS patients. Findings from this study provide baseline data for establishing initial benchmark criteria for the Quality Indicator of an annual MS specialty visit.

Ultimately, future research will use this method to assess geographic variability and potential access gaps for the national MS System of Care. Specifically, the data from this study will be used to re-evaluate the annual MS-specialty visit quality indicator to establish a baseline benchmark value that will be used to assess quality improvement activities in the future.

Results from this project can impact recommendations for health care management and delivery of care to MS patients by identifying geographically underserved areas and by testing a variety of “what-if” scenarios. The GIS mapping technique used in this study provides a powerful and valuable tool for policy and planning personnel when evaluating how to address underserved populations and areas within the VHA healthcare system not only for MS but for ALL conditions and diseases affecting the veteran population.

II. MS CoE-West Catchment Area

Figure 1

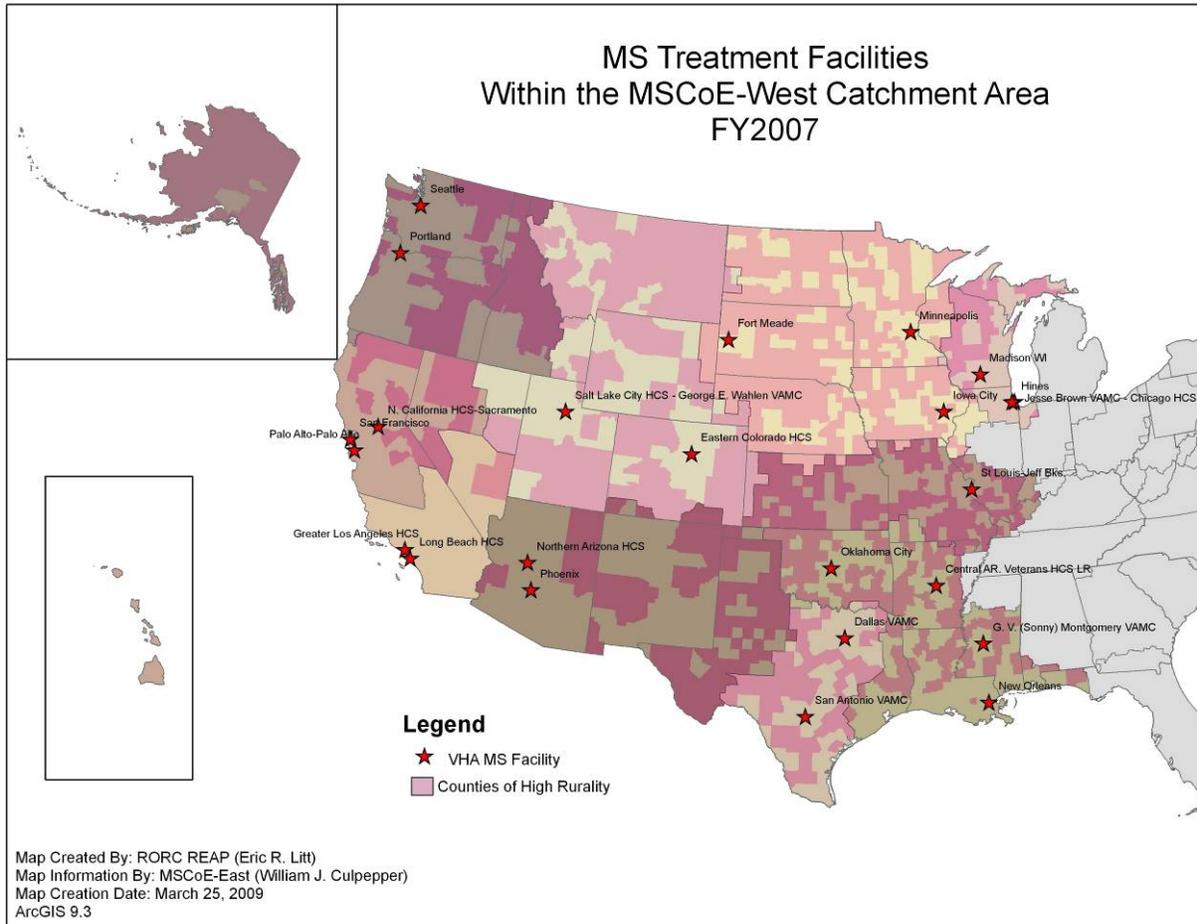
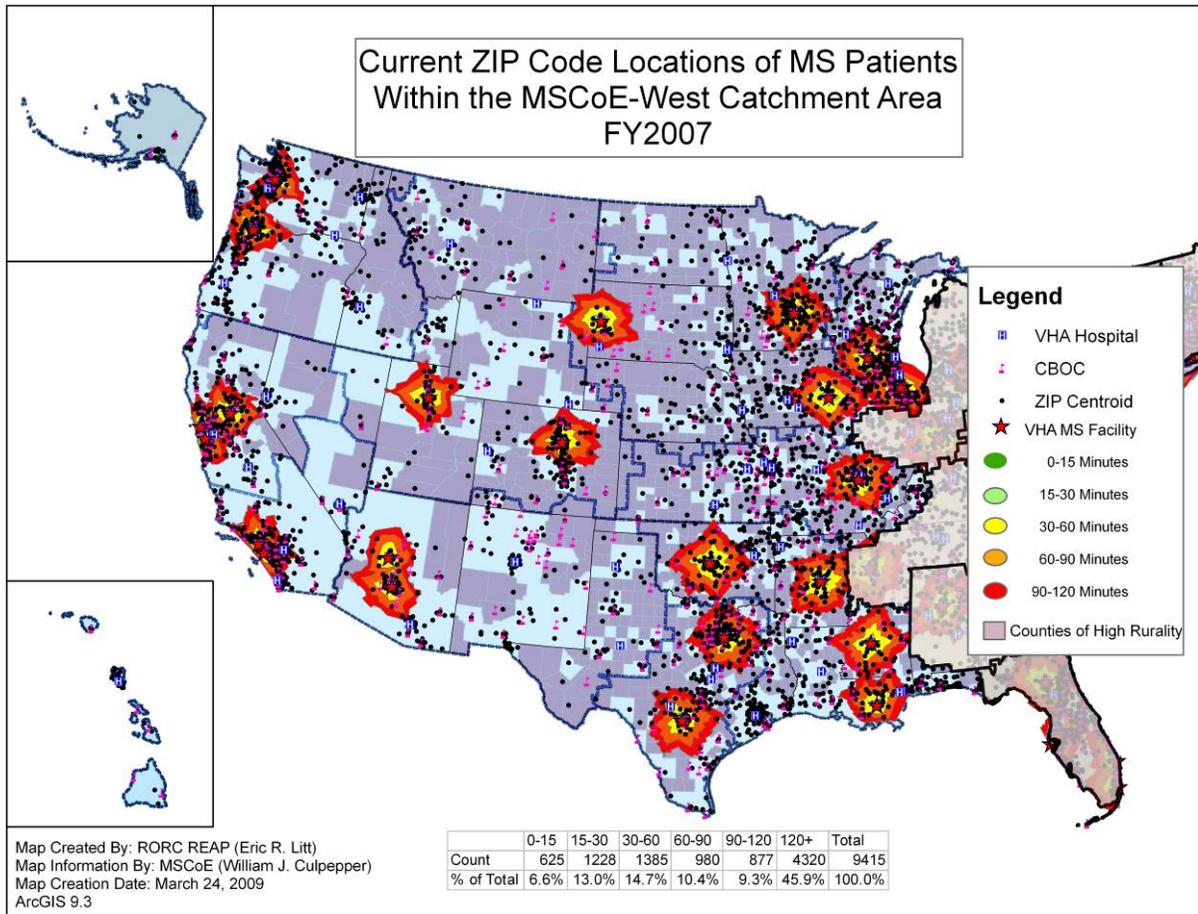


Figure 2



III. VISN Data & Maps

Figure 3

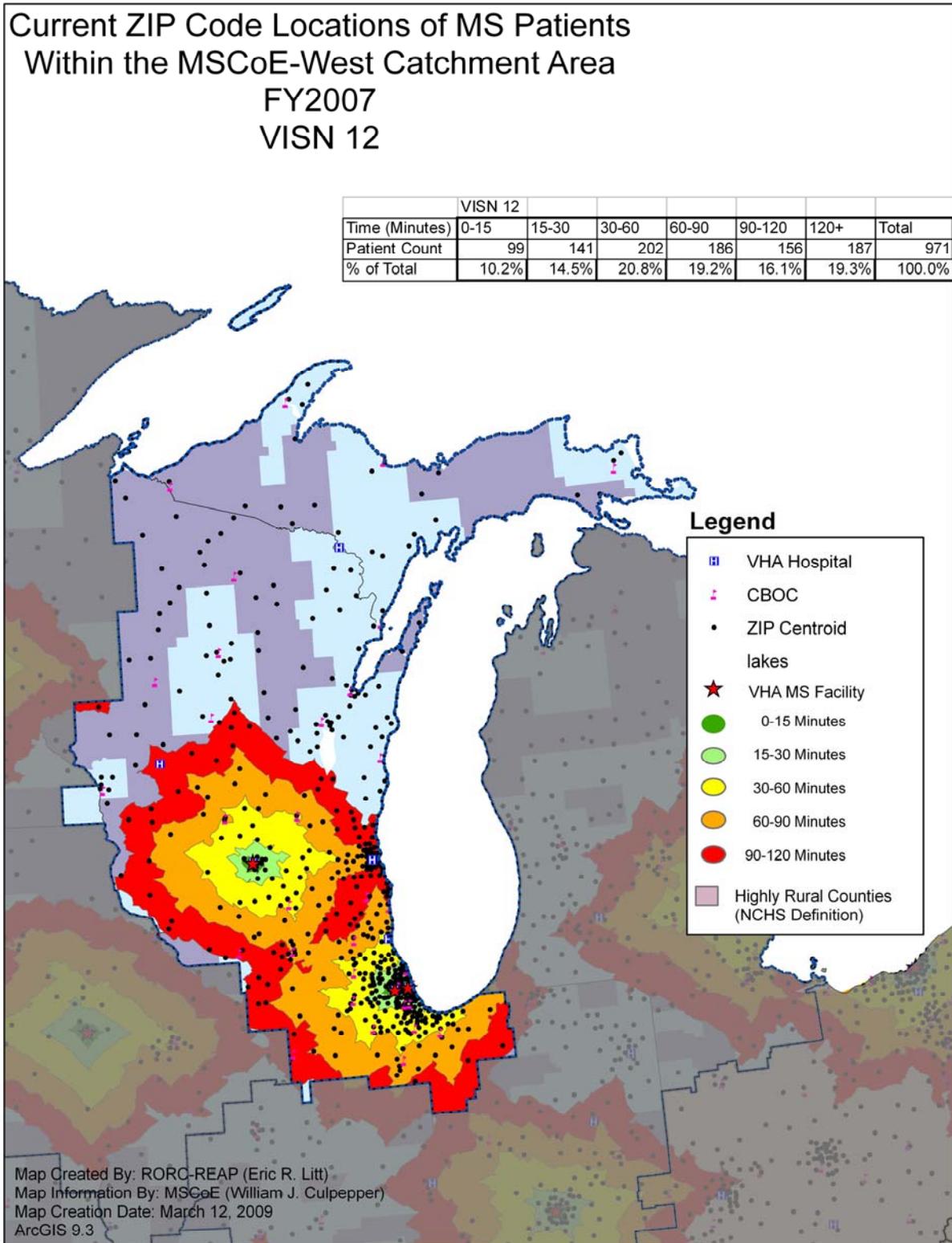


Figure 4

Current ZIP Code Locations of MS Patients
 Within the MSCoE-West Catchment Area
 FY2007
 VISN 15

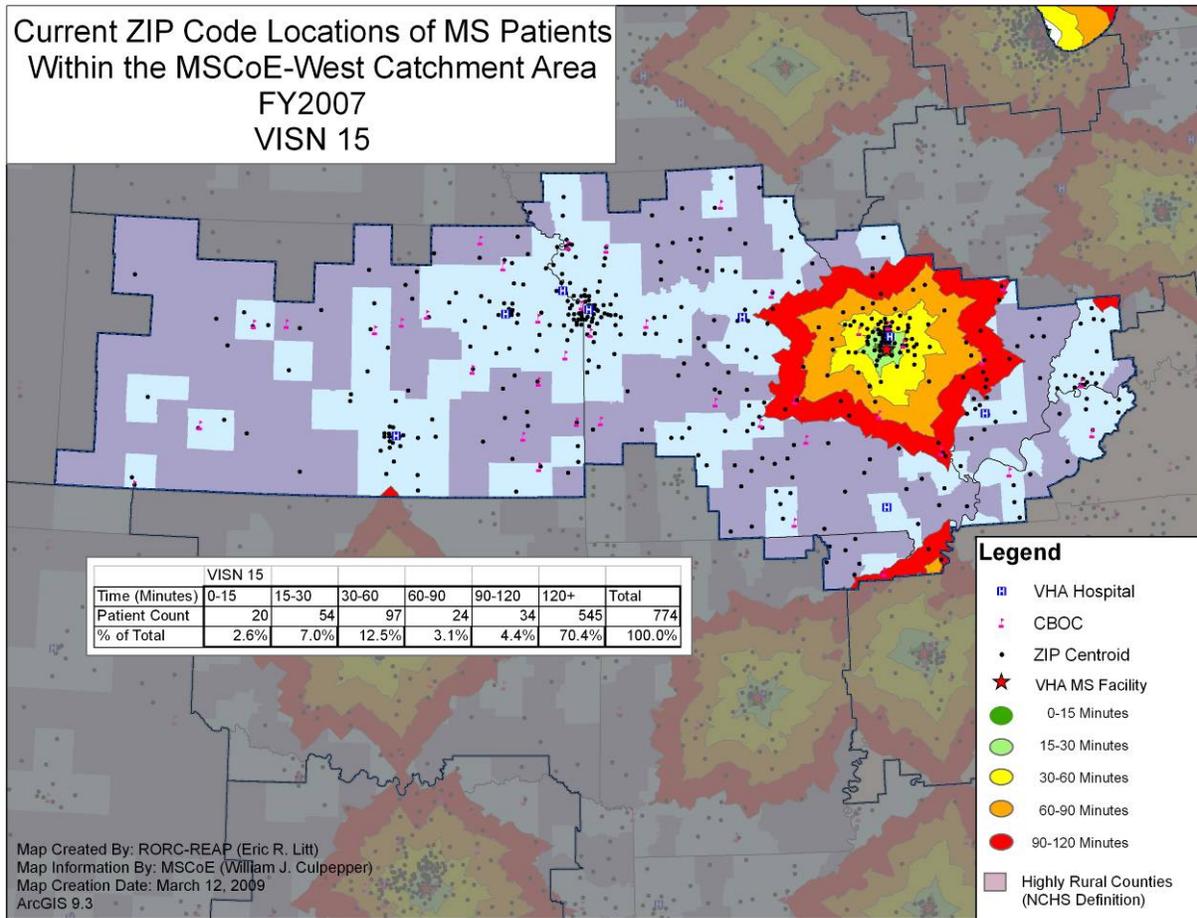


Figure 5

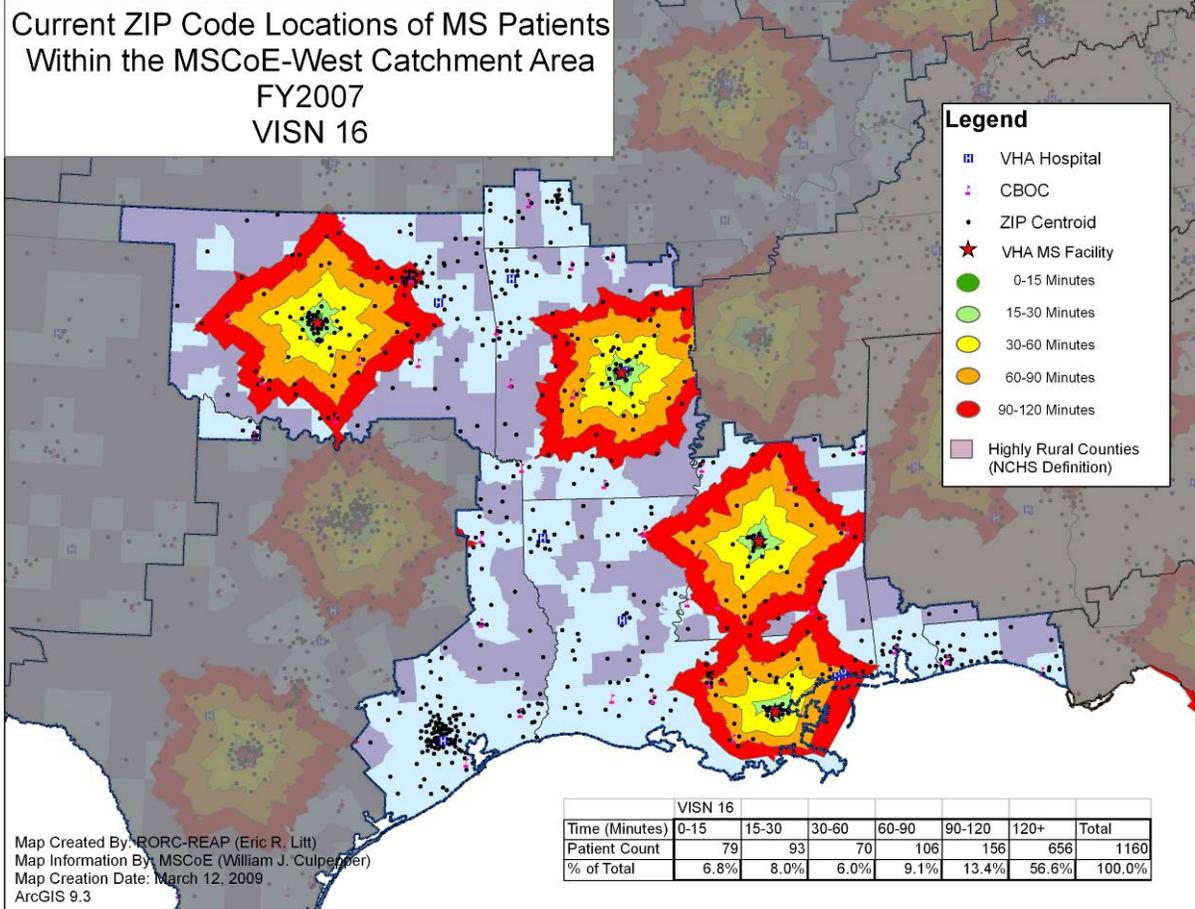
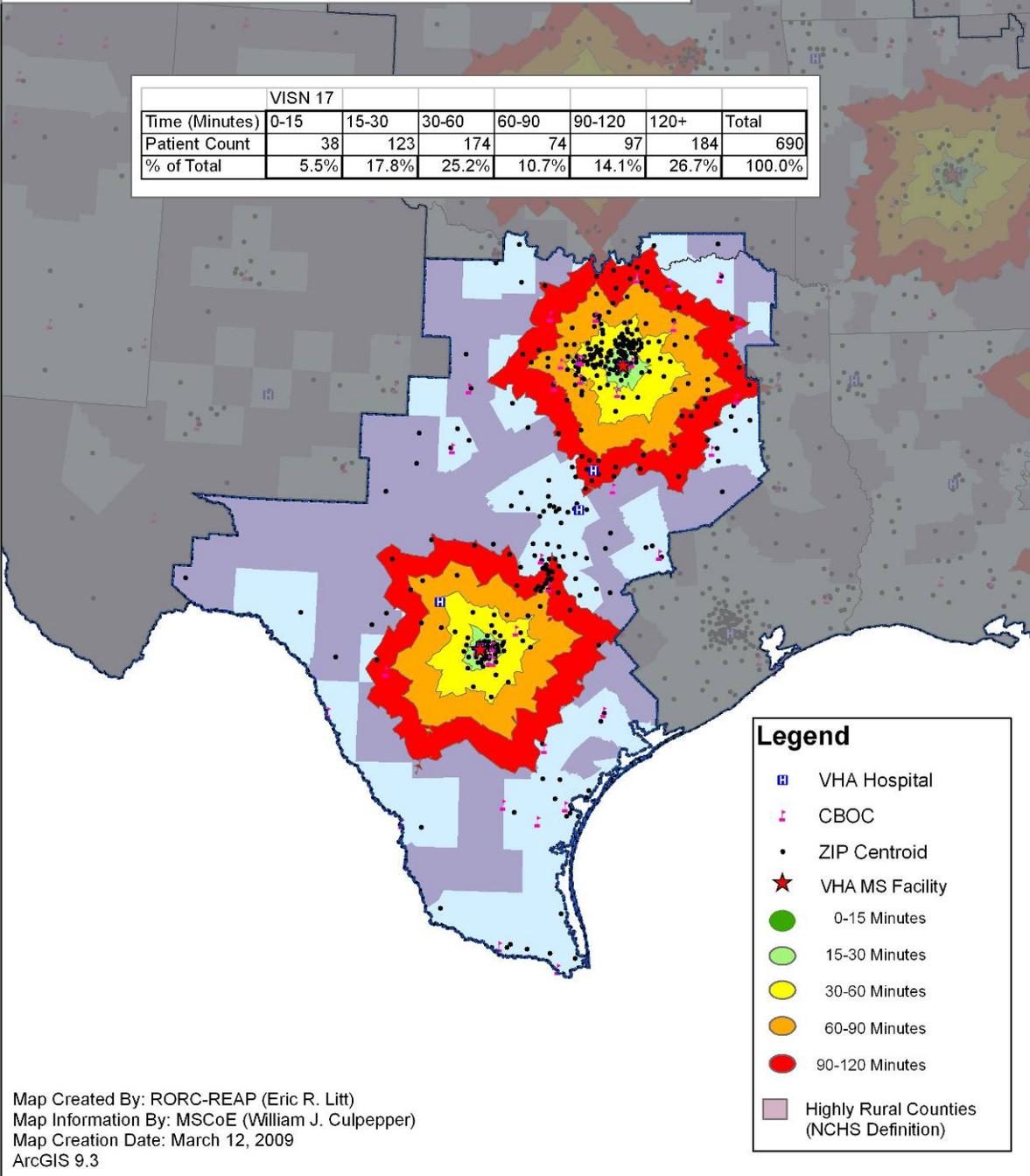


Figure 6

Current ZIP Code Locations of MS Patients
Within the MSCoE-West Catchment Area
FY2007
VISN 17

	VISN 17						
Time (Minutes)	0-15	15-30	30-60	60-90	90-120	120+	Total
Patient Count	38	123	174	74	97	184	690
% of Total	5.5%	17.8%	25.2%	10.7%	14.1%	26.7%	100.0%



- Legend**
- VHA Hospital
 - CBOC
 - ZIP Centroid
 - ★ VHA MS Facility
 - 0-15 Minutes
 - 15-30 Minutes
 - 30-60 Minutes
 - 60-90 Minutes
 - 90-120 Minutes
 - Highly Rural Counties (NCHS Definition)

Map Created By: RORC-REAP (Eric R. Litt)
Map Information By: MSCoE (William J. Culpepper)
Map Creation Date: March 12, 2009
ArcGIS 9.3

Figure 7

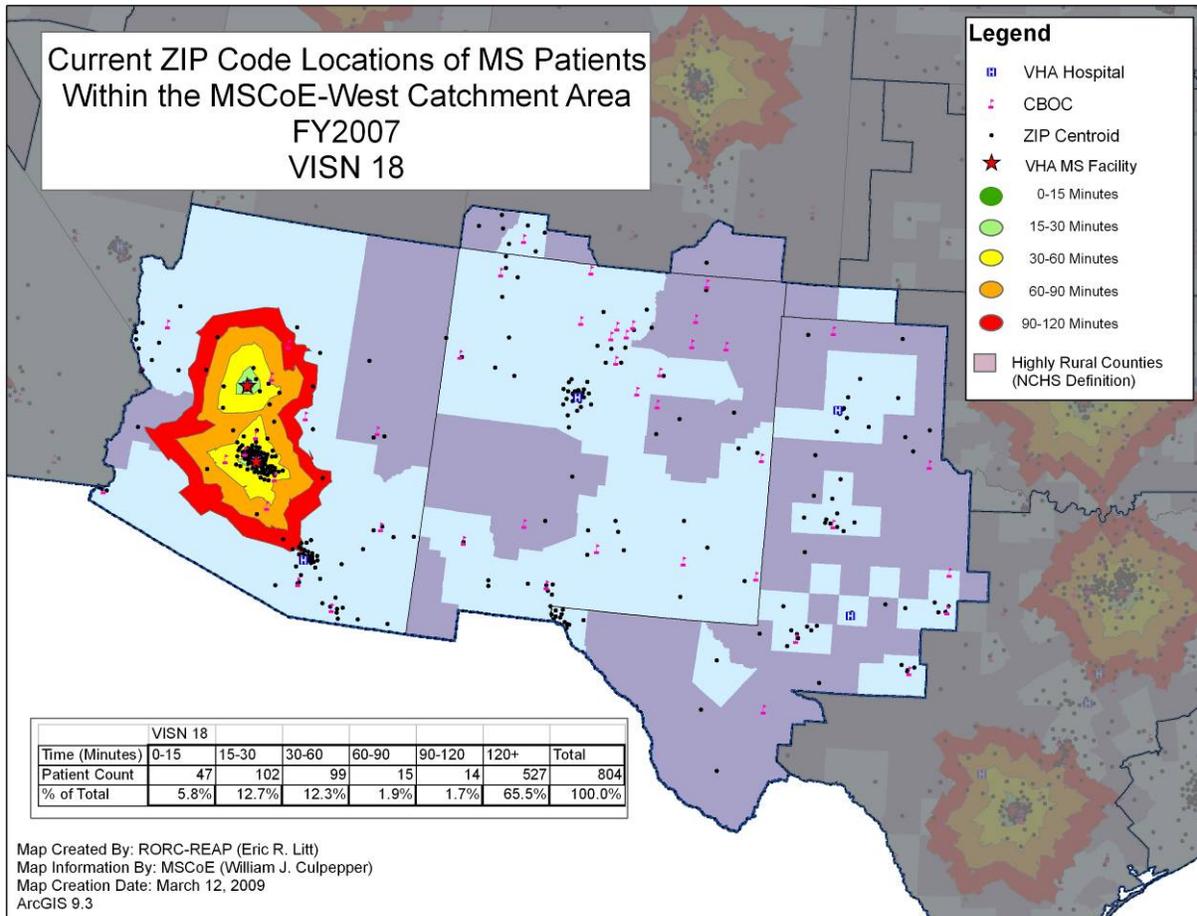


Figure 8

Current ZIP Code Locations of MS Patients
 Within the MSCoE-West Catchment Area
 FY2007
 VISN 19

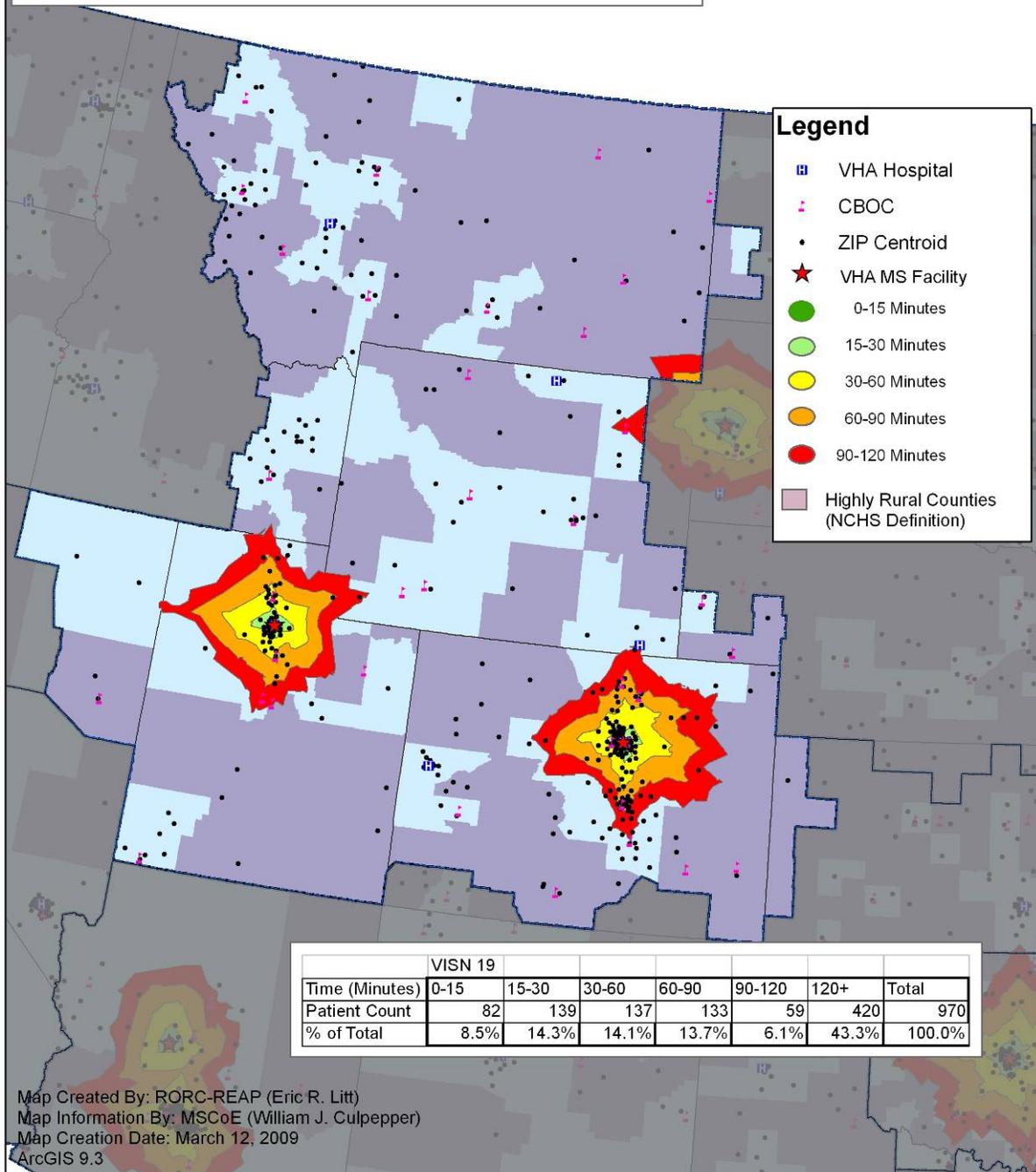


Figure 9

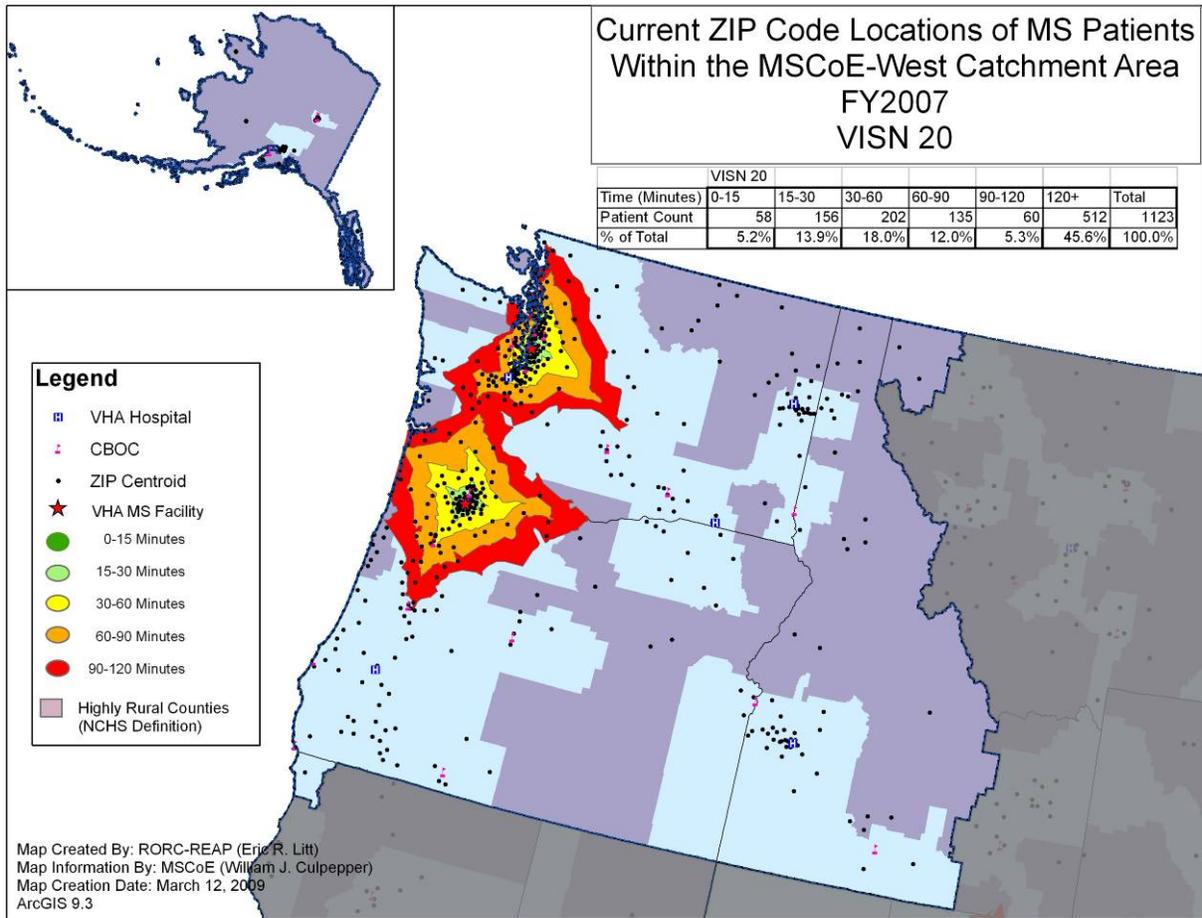
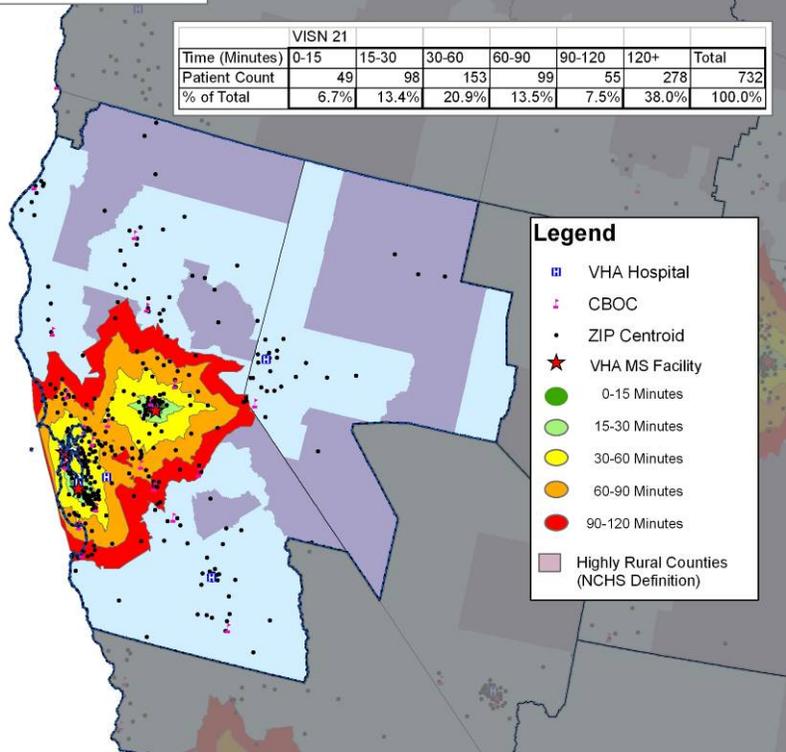
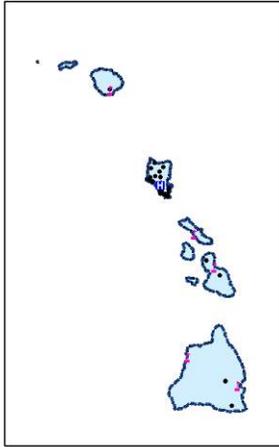


Figure 10

Current ZIP Code Locations of MS Patients
 Within the MSCoE-West Catchment Area
 FY2007
 VISN 21

	VISN 21						
Time (Minutes)	0-15	15-30	30-60	60-90	90-120	120+	Total
Patient Count	49	98	153	99	55	278	732
% of Total	6.7%	13.4%	20.9%	13.5%	7.5%	38.0%	100.0%



- Legend**
- VHA Hospital
 - ▲ CBOC
 - ZIP Centroid
 - ★ VHA MS Facility
 - 0-15 Minutes
 - 15-30 Minutes
 - 30-60 Minutes
 - 60-90 Minutes
 - 90-120 Minutes
 - Highly Rural Counties (NCHS Definition)

Map Created By: RORC-REAP (Eric R. Litt)
 Map Information By: MSCoE (William J. Culpepper)
 Map Creation Date: March 12, 2009
 ArcGIS 9.3

Figure 11

Current ZIP Code Locations of MS Patients
 Within the MSCoE-West Catchment Area
 FY2007
 VISN 22

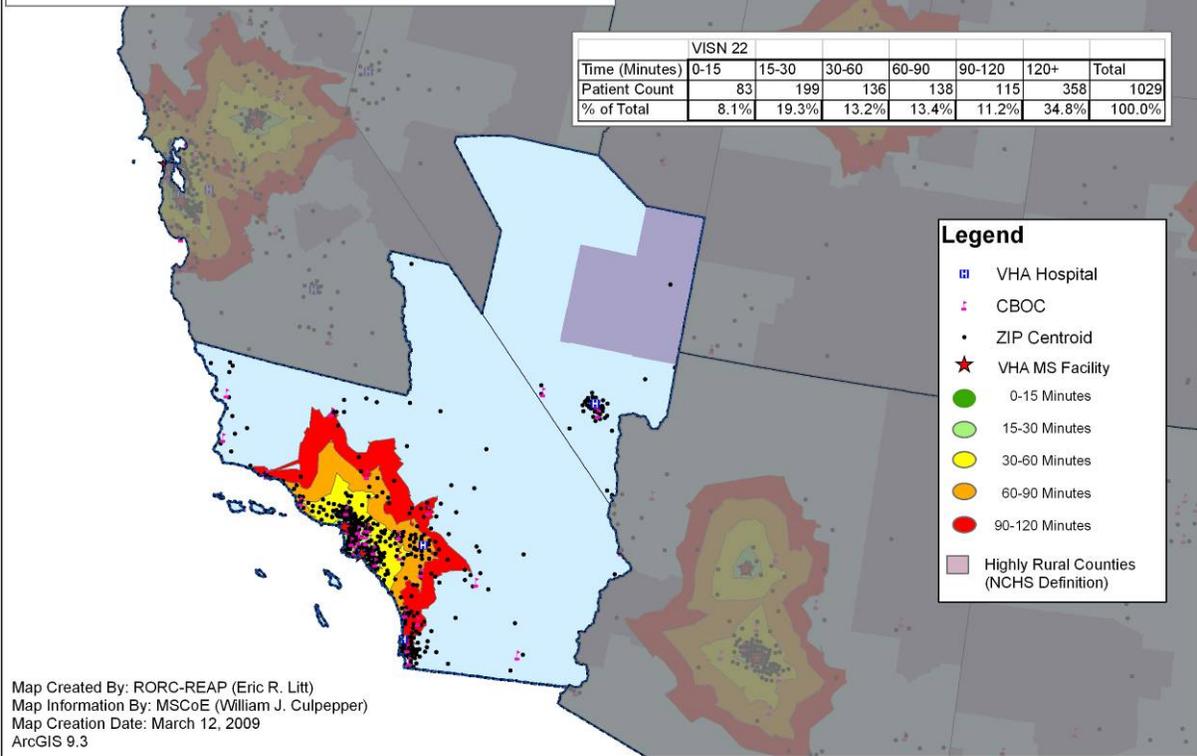
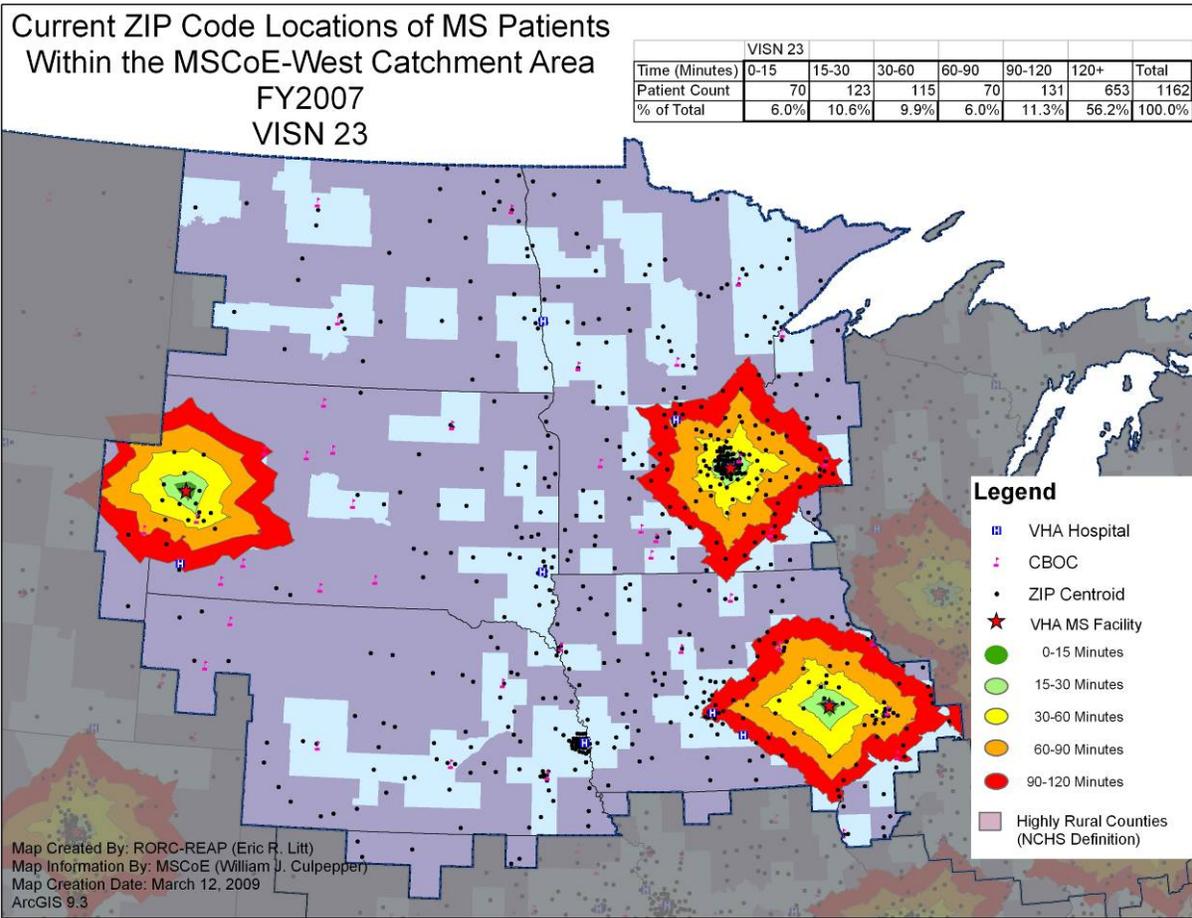


Figure 12



IV. Travel Time Summary Table

Table 1 provides the number and percentages of MS patients broken down by travel categories: 0-15 minutes, 15-30 minutes, 30-60 minutes, 60-90 minutes, 90-120 minutes, and more than 120 minutes for each VISN and for the entire MS CoE-West Catchment Area.

Table 1: Number and Percentage of MS Patients by Travel Time Breakdown, MS CoE-West Total and by Veterans Integrated Service Network (VISN), FY2008						
VISN	0-15 Min. N (%)	15-30 Min. N (%)	30-60 Min. N (%)	60-90 Min. N (%)	90-120 Min. N (%)	120+ Min. N (%)
12	99 (10.2%)	141 (14.5%)	202 (20.8%)	186 (19.2%)	156 (16.1%)	187 (19.3%)
15	20 (2.6%)	54 (7.0%)	97 (12.5%)	24 (3.1%)	34 (4.4%)	545 (70.4%)
16	79 (6.7%)	93 (8.0%)	70 (6.0%)	106 (9.1%)	156 (13.4%)	656 (56.6%)
17	38 (5.5%)	123 (17.8%)	174 (25.2%)	74 (10.7%)	97 (14.1%)	184 (26.7%)
18	47 (6.8%)	102 (12.7%)	99 (12.3%)	15 (1.9%)	14 (1.7%)	527 (65.5%)
19	82 (8.5%)	139 (14.3%)	137 (14.1%)	133 (13.7%)	59 (6.1%)	420 (43.3%)
20	58 (5.2%)	156 (13.9%)	202 (18.0%)	135 (12.0%)	60 (5.3%)	512 (45.6%)
21	49 (6.7%)	98 (13.4%)	153 (20.9%)	99 (13.5%)	55 (7.5%)	278 (38.0%)
22	83 (8.1%)	199 (19.3%)	136 (13.2%)	138 (13.4%)	115 (11.2%)	358 (34.8%)
23	70 (6.0%)	123 (10.6%)	115 (9.9%)	70 (6.0%)	131 (11.3%)	653 (56.2%)
MS CoE-West TOTAL	625 (6.6%)	1,228 (13.0%)	1,385 (14.7%)	980 (10.4%)	877 (9.3%)	4,320 (45.9%)

V. “What if?” Scenarios: The Utility of GIS in Decision-Making

Many variables need to be considered before establishing new specialty clinics. Factors such as staffing, MS expertise, and a host of other facility-related characteristics come into play before these decisions can be made, underscoring the need for a comprehensive inventory of available resources by facility within each VISN. Once candidates for site location are chosen, GIS tools can provide National, VISN and facility management information on the impact each candidate site could have on the current patient population being treated in the catchment area.

In this section, three “what if” scenarios are presented as examples of how access to specialty care for MS patients might change if an additional MS specialty care clinic is added in a Network. Table 2 shows the travel time breakdowns for the three example VISNs. For illustrative purposes, we chose VISN 15 (adding Kansas City VAMC), VISN 16 (adding Houston VAMC), and VISN 18 (adding Albuquerque VAMC) and recalculated the travel time (Table 3).

VISN	0-15 Min. N (%)	15-30 Min. N (%)	30-60 Min. N (%)	60-90 Min. N (%)	90-120 Min. N (%)	120+ Min. N (%)
VISN15	20 (2.6%)	54 (7.0%)	97 (12.5%)	24 (3.1%)	34 (4.4%)	545 (70.4%)
VISN 16	79 (6.7%)	93 (8.0%)	70 (6.0%)	106 (9.1%)	156 (13.4%)	656 (56.6%)
VISN 18	47 (6.8%)	102 (12.7%)	99 (12.3%)	15 (1.9%)	14 (1.7%)	527 (65.5%)

In VISN 15, if a MS-specialty clinic was placed at the Kansas City VAMC (compare Figures 4 and 13) the proportion of patients traveling more than 2-hours would be decreased from 70.4% to 40.8%. If an MS-specialty clinic was placed at the Houston VAMC (compare Figures 5 and 14), the proportion traveling more than 2-hours in VISN 16 would be decreased from 56.6% to 39.8%. Similarly, If an MS-specialty clinic was placed at the Albuquerque VAMC (compare Figures 7 and 15), the proportion traveling more than 2-hours in VISN 18 would be decreased from 65.5% to 50.1%. Other facility locations within a given VISN can be similarly evaluated to determine which additional facility results in the largest reduction in the proportion of veterans traveling more than 2-hours for MS-specialty care.

VISN	0-15 Min. N (%)	15-30 Min. N (%)	30-60 Min. N (%)	60-90 Min. N (%)	90-120 Min. N (%)	120+ Min. N (%)
VISN 15	50 (6.5%)	113 (14.6%)	148 (19.1%)	77 (9.9%)	70 (9.0%)	316 (40.8%)
VISN 16	97 (8.4%)	153 (13.2%)	140 (21.1%)	127 (10.9%)	181 (15.6%)	462 (39.8%)
VISN 18	86 (10.7%)	154 (19.2%)	126 (15.7%)	20 (2.5%)	24 (3.0%)	403 (50.1%)

Figure 13

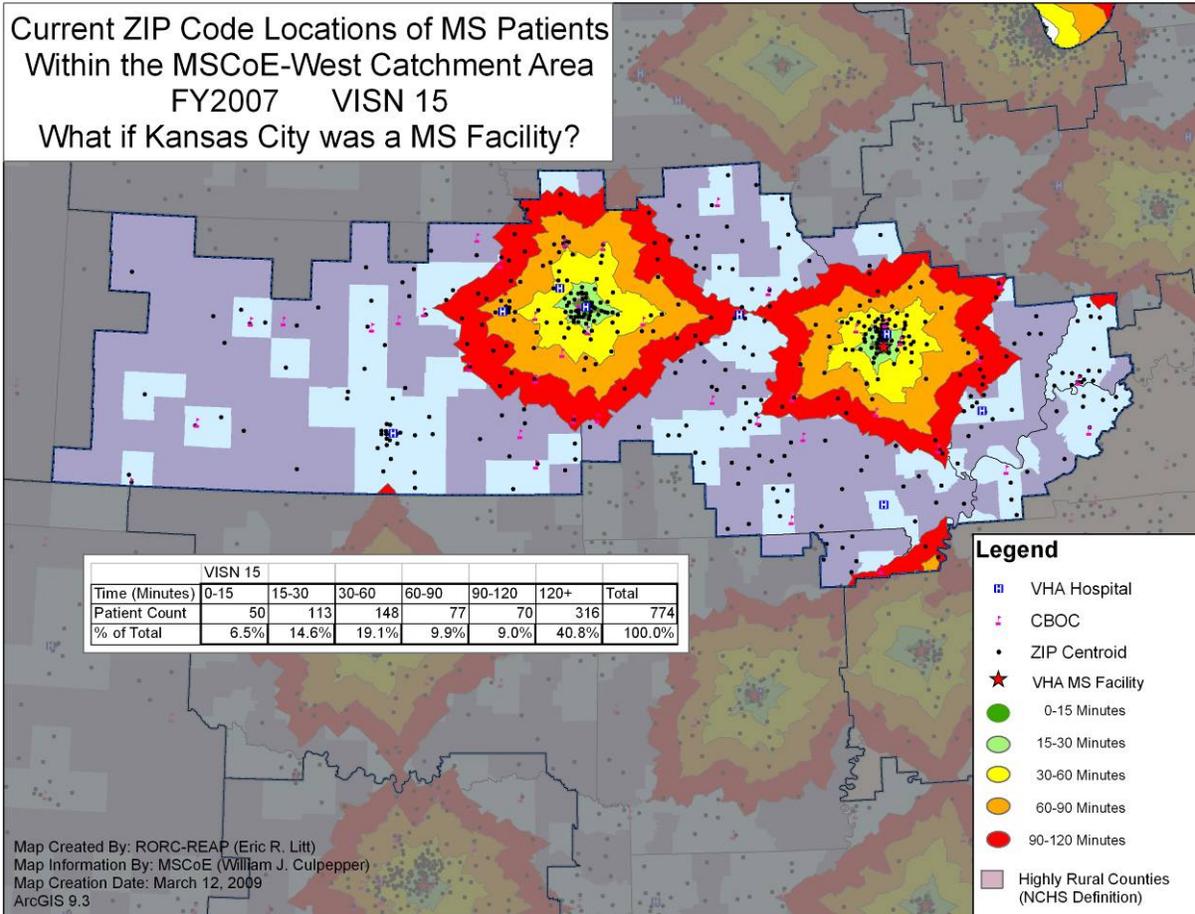


Figure 14

Current ZIP Code Locations of MS Patients
 Within the MScOE-West Catchment Area
 FY2007 VISN 16
 What if Houston was a MS facility?

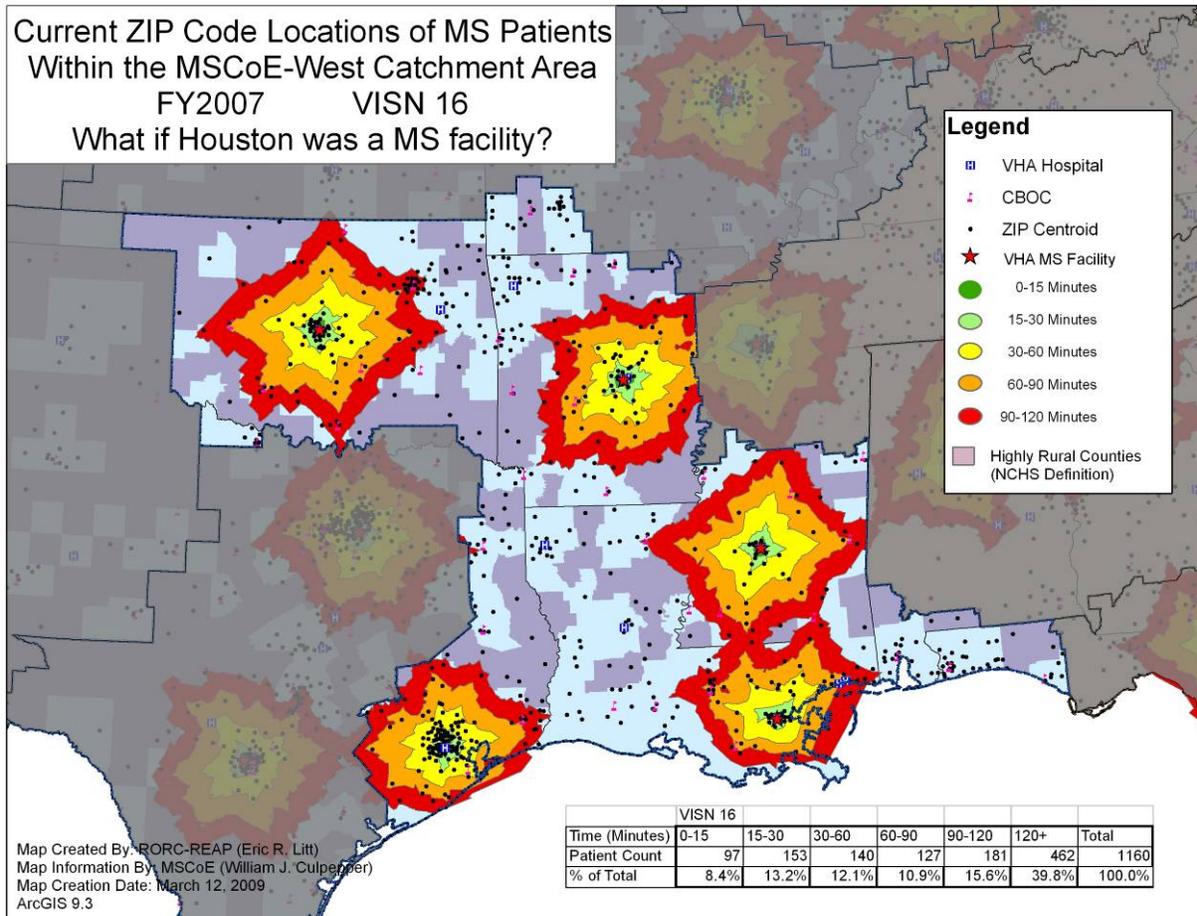
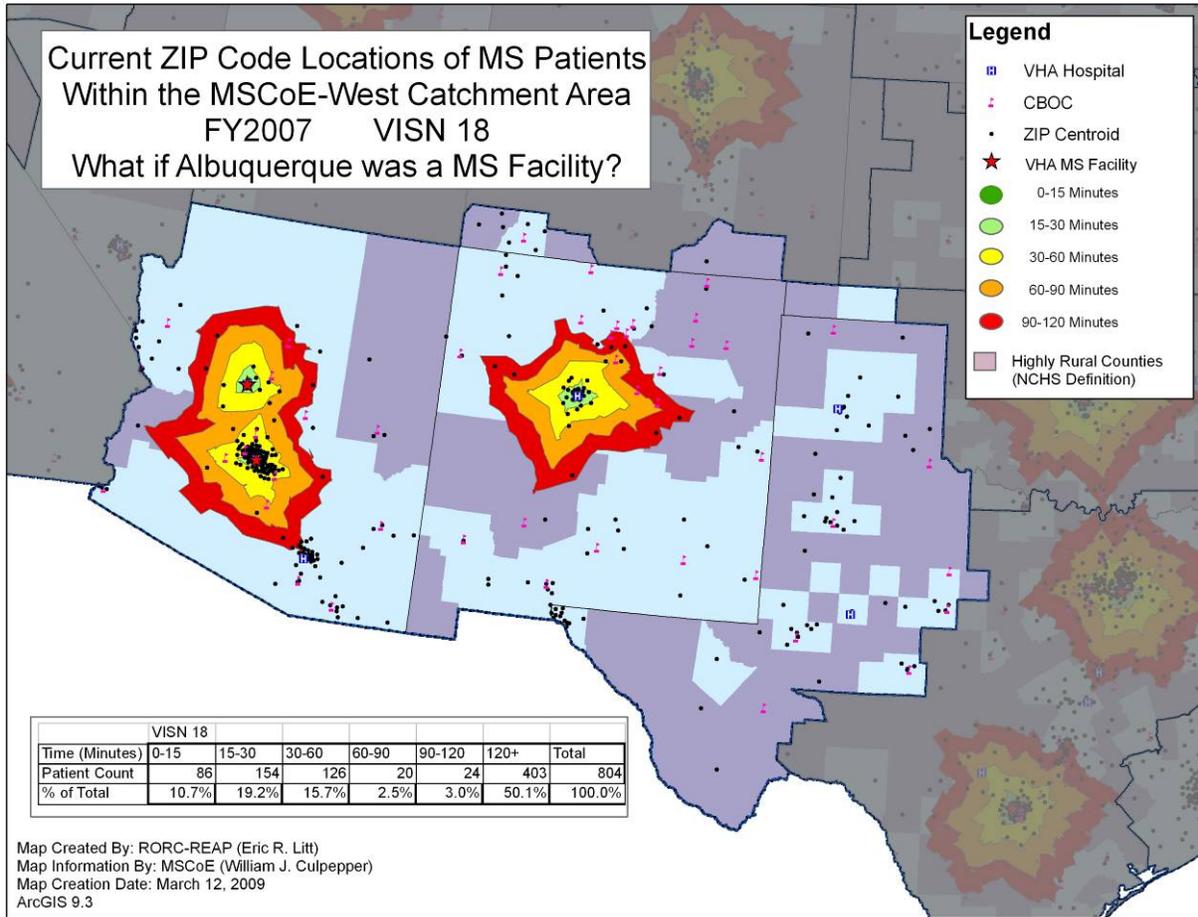


Figure 15



VI. Highlights

- The availability and accessibility of specialty MS care varies widely across VISNs in the MS CoE-West catchment area.
 - Over 45 percent of MS patients in the total catchment area (VISN 12 – VISN 23) travel more than two hours to specialty MS care (45.9%).
 - Access to MS specialty care appears poorest in VISN 15. Only 2.6% of MS patients are within 30 minutes and 70.4% of MS patients in this VISN reside more than a two hour travel time to a MS specialty site.
 - Other VISNs where more than half of patients travel more than two hours to MS specialty care include: VISN 18 (65.5%), VISN 16 (56.6%), and VISN 23 (56.2%)
 - VISN 12 and VISN 17 show greater relative accessibility to specialty care for MS patients than other VISNs in the MS CoE-West catchment area.
 - The percentage of MS patients in VISN 12 and VISN 17 who are more than two hours from specialty care is 19.3% and 26.7% respectively.
- GIS can be used at both the national and VISN level to select the best candidates for placement of new specialty clinics and/or tele-health programs, once facility characteristics are taken into account.
- The GIS mapping technique utilized in this study provides the ability to test “what-if” scenarios. Specifically, we can test how much of a reduction in the proportion of patients having to travel more than 2-hours for MS-specialty care is achieved if MS-specialty care was implemented at an additional facility(s).
- The GIS mapping technique used in this study provides a powerful and valuable tool for policy and planning personnel when evaluating how to address underserved populations and areas within the VHA healthcare system not only for MS but for ALL conditions and diseases affecting the veteran population.