

NARCOMS: Past , Present and Future

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North American Research Committee on Multiple Sclerosis

- Established in 1993 by the CMSC
- North American Research Consortium On Multiple Sclerosis.
- 1999 the word Consortium was changed to Committee.
- Develop a patient Registry to help facilitate multi-center research in the broad field of Multiple Sclerosis.

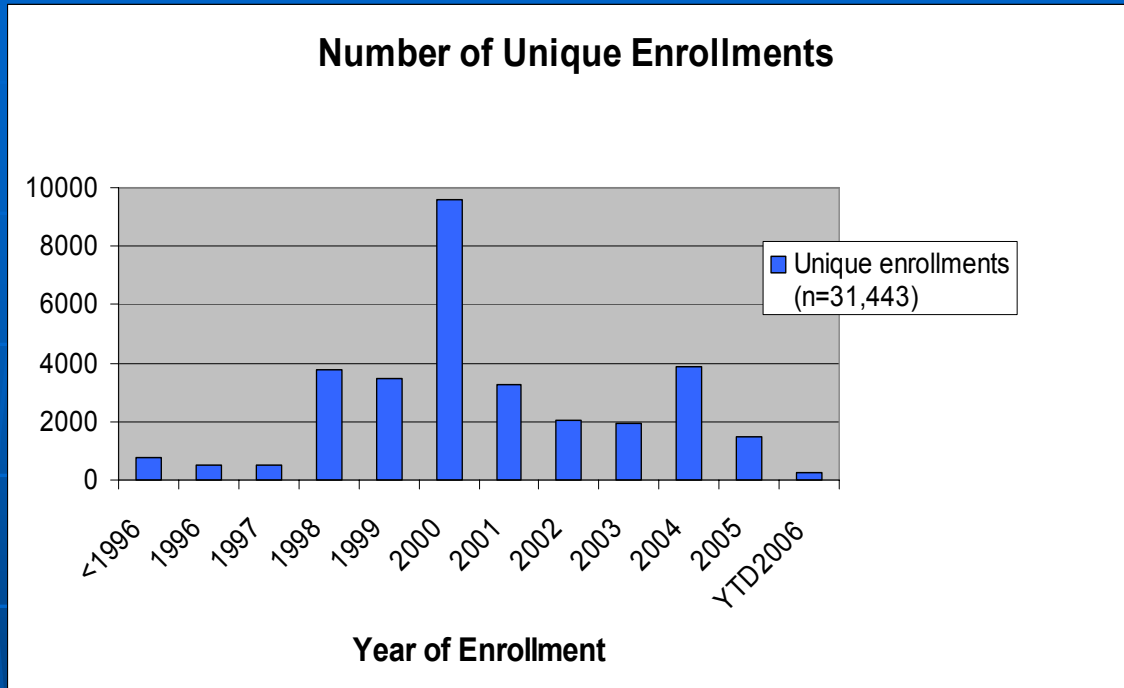
The registry, a project of the Consortium of MS Centers

North American Research Committee on Multiple Sclerosis

The Registry is a database consisting of functional, accessible information that is used by investigators to develop research strategies and survey MS issues.

It is a prospective longitudinal study of MS and treatment outcomes.

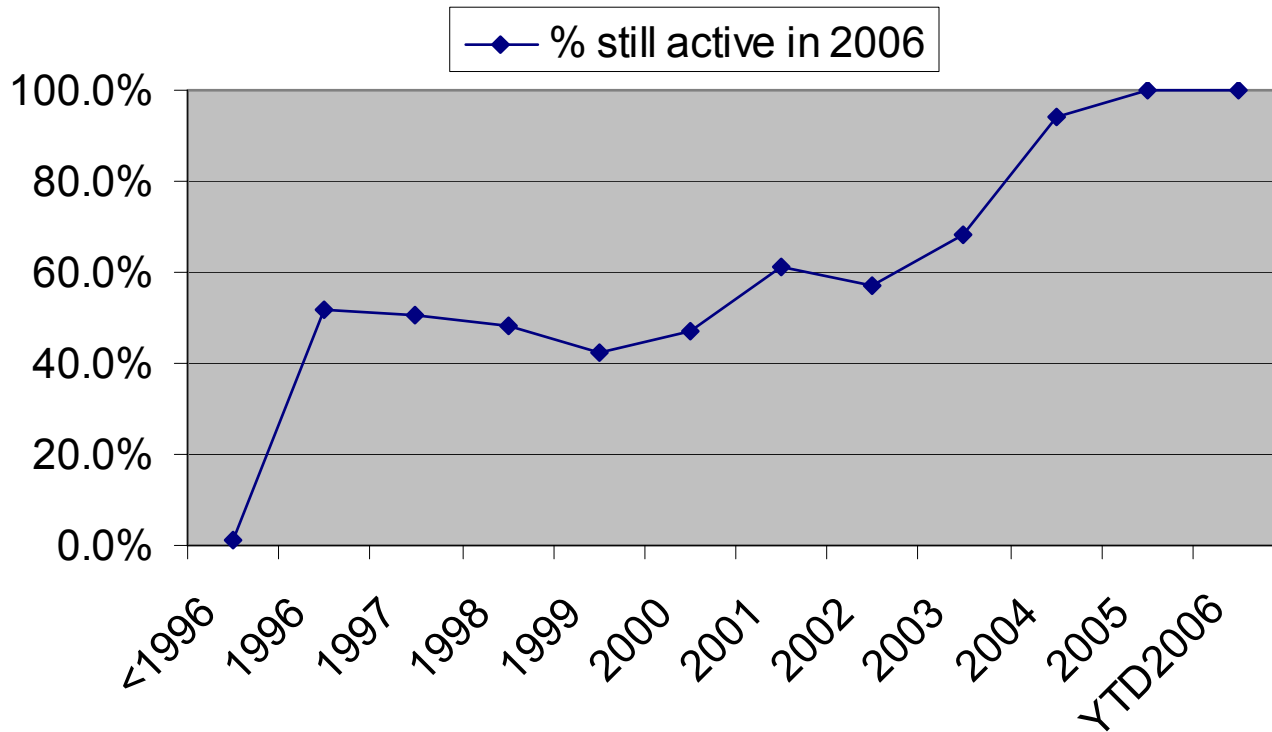
- It facilitates subject recruitment for clinical trials.
- It allows investigators to conduct research studies (N>31,000 unique enrollments).



- In 1996, Dr. Timothy Vollmer, M.D., was appointed Director of NARCOMS.
- Initiated the assessment of disease specific information through an enrollment questionnaire.
- Recruitment was initially slow to progress due to insufficient funds and an overall lack of awareness of the Registry's function and value.

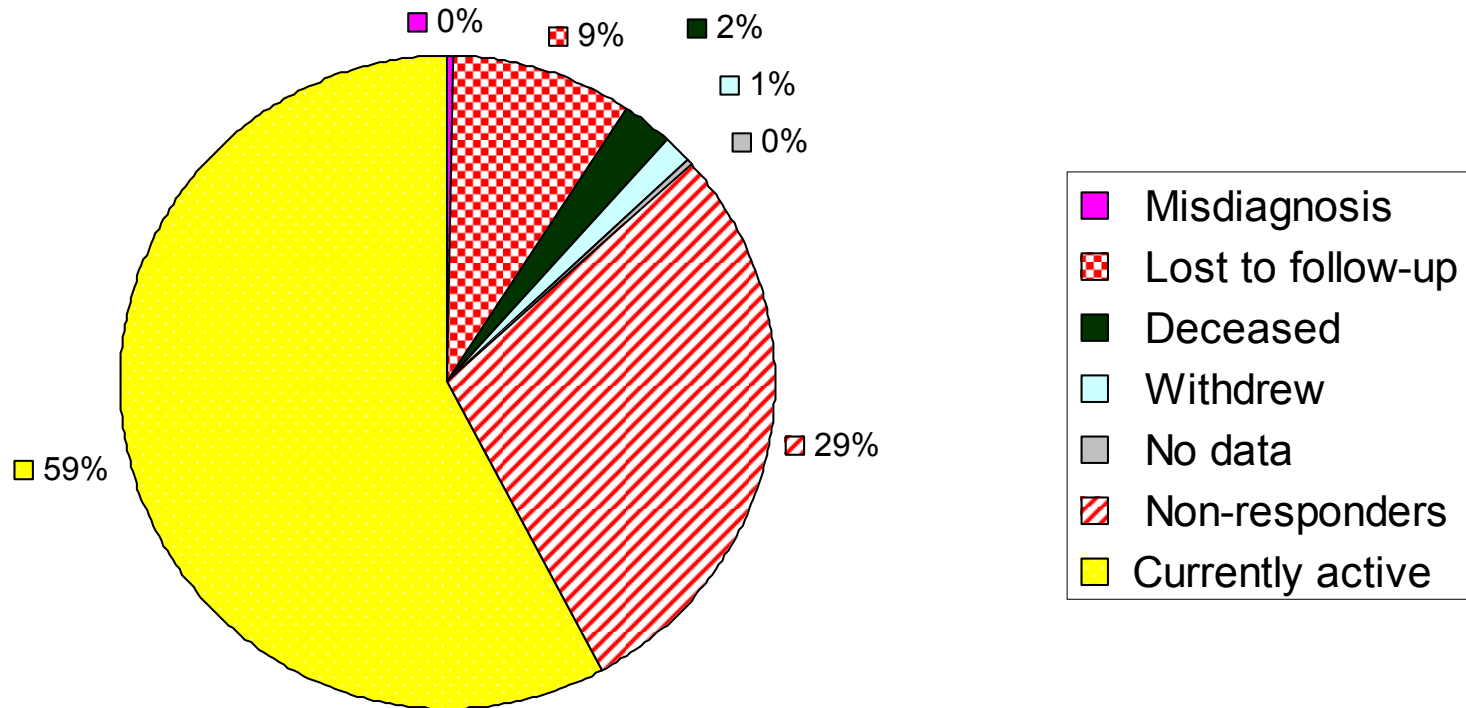
Participant adherence rate by year of enrollment

Adherence Rate by Year of Enrollment



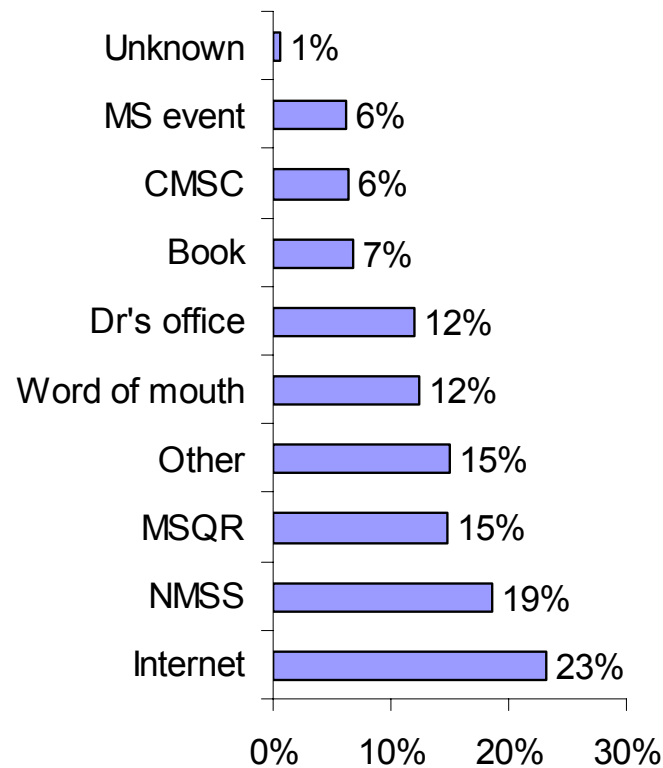
Current status of NARCOMS participants in the U.S.

Status of NARCOMS participants in the U.S.A. (n=30,833)



How did they get to us?

Enrollment sources in 2005



Database development

- Original SQL database
 - Programming done by PhD students at Yale (limited tools and funding)
 - Fully functional ACCESS interface
- Database was moved to Phoenix, AZ in 2003
 - Development and hosting done by emerge.md (Dr. Partovi)
 - Data still in SQL server, but better user interface through proprietary PHI editor and Access (Real time data management)
 - Virtual DeskTop access for research group
 - Enhanced on-line participation

■ Enrollment Questionnaire

- Demographics, household info, employment information, health insurance info, MS history, relapse history, medications, other health care providers seen, disability (PDDS and PS), immunologic and symptomatic treatments.

■ Updates: Self-report data are collected twice a year

- All of the above
- Immunologic and symptomatic treatments – changes with changes in available therapies

Reliability and Validity of Two Self-reported Measures of Impairment and Disability for MS

Performance scales (PS) measure disability in eight domains of function:

- mobility, hand function, vision, fatigue, cognition, bladder/ bowel, sensory, and spasticity, (pain, depression, coordination)
- Test-retest reliability coefficient for the total score was 0.89, and for the eight subscales ranged from 0.65 to 0.91. (The coefficient for mobility was 0.91).
- Alpha reliability (Cronbach's Alpha) for the total score was 0.78.
- Correlation coefficient between PS and EDSS is 0.62 ($p < .0001$).

Reliability and Validity of Two Self-reported Measures of Impairment and Disability for MS

- Patient Determined Disease Steps (PDDS)
Based on Disease Steps (a scale developed by M.Hohol, E.Orav, and H.Weiner) evaluates disease progression over time.
 - The Spearman correlation coefficient between Disease Steps and the EDSS was 0.958.

Pros and Cons of semi-annual vs. ongoing update surveys

Semi-annual updates

- Lower printing and bulk mailing cost
- Legacy → participants know to expect the spring/fall update
- Participants can be “primed” with timely MSQR reminders
- Simple to track responses
- Allows comparisons with cross sectional data sets since 1996

Pros and Cons of semi-annual vs. ongoing update surveys

Challenges:

- Large quantity of incoming mail and review require temporary help
- Processing required outsourcing data-entry (delay, cost, entry errors in open ended questions due to unfamiliar concepts), more recently done inhouse
- Prolonged cycle delays access to "current" data (3-4 months*)
- Emerging topics for questions can not be implemented until the next scheduled update

Pros and Cons of semi-annual vs. ongoing update surveys

Ongoing updates:

- Work-flow spread more evenly
- More flexible for patients
- “Current” data available at any time
- Data could be entered in-house as the responses come in

Ongoing updates:

Challenges:

- Higher printing and mailing cost
- Logistics in sending out the surveys
- Logistics in keeping track of who has responded
- Logistics in customer support for different updates
- Impact of historical events not the same on all
- Seasonal impact not the same on all (temperature, sunlight, holidays)
- Potential resistance to change among long-term participants ?

Areas of Research Utilizing NARCOMS Database

- Factors affecting quality of life
- Cost of illness
- Dysphagia
- Enhancement of clinical trial design
- Spasticity
- Disability levels
- Aging with MS
- Sexuality issues
- Co-morbidities
- Depression
- Treatment patterns
- Treatment adherence/switching behavior
- Employment status
- Fatigue
- Pain syndromes
- Access to healthcare
- Healthcare experience of minorities with MS

Areas of Research Utilizing NARCOMS Database

Care-partner Questionnaire

Objectives of this study are:

1. To identify the potential medical needs and emotional impact on the MS CarePartner community.
2. Heighten their awareness of the effects of caregiver stress.
3. To use this data to assist with the development and implementation of early detection screening programs for MS CarePartners

Exciting data on items “partner expects too much” “not enough money” “should be doing more” “lost control of my life” etc

Lessons learned

- Long-term planning
 - Managing growth (logistics in place)
 - Internet
 - International expansion
 - Advisory panel and vision
- Industry standards
 - Database expertise (proper tools, staffing)
 - Security, privacy, regulations
 - IRB approval if used for research

Lessons learned

- Frequent interaction with participants
 - Encouragement via MSQR column 4 x year helps
 - Process for address etc. changes in place from the beginning
- Funding
 - Growth brings more database users, but it cost more to maintain
 - Consult with the research community to meet current and future needs to ensure the data remains relevant
 - Visibility through publications, conferences, links etc.

Conference presentations on NARCOMS data (2002 – 2004)

- Hadjimichael, O. (2004). Gender-Dependent MS: Males as seen in the NARCOMS patient registry. Workshop presentation, CMSC annual meeting in Toronto, June 2004.
- Hadjimichael O, Li, J., & Vollmer, T. (2003) NARCOMS Patient Registry: an Update – MS treatment in the USA. Platform presentation, CMSC annual meeting in San Diego, May 2003
- Rizzo, M., Hadjimichael, O., Li, J., Kerns, R., & Vollmer, T. (2003). Positive Symptom complexes in multiple sclerosis. A Narcoms study. A platform presentation at the 17th Annual meeting of the CMSC in San Diego, May 2003.
- Preiningerova, J., Hadjimichael, O., Vollmer, T. & Rizzo, M. (2003). Validation of patient-reported disease descriptors in the NARCOMS Patient Registry. The 17th Annual meeting of the CMSC in San Diego, May 2003.
- Tyry, T. (2004). Quality of Life in MS: Presented with data from the NARCOMS Patient Registry. ICODIMS presentation at the 18th Annual meeting of the CMSC in Toronto, June 2004.
- Vollmer, T. (2004). Update on NARCOMS status: disability as a function of disease duration. ICODIMS presentation at the 18th Annual meeting of the CMSC in Toronto, June 2004.

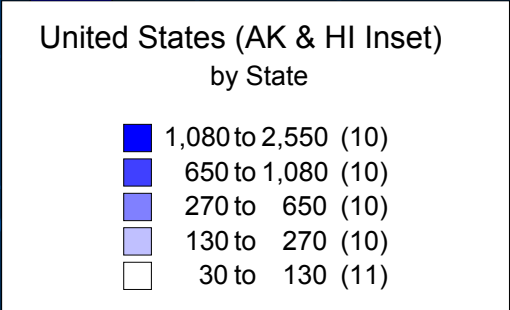
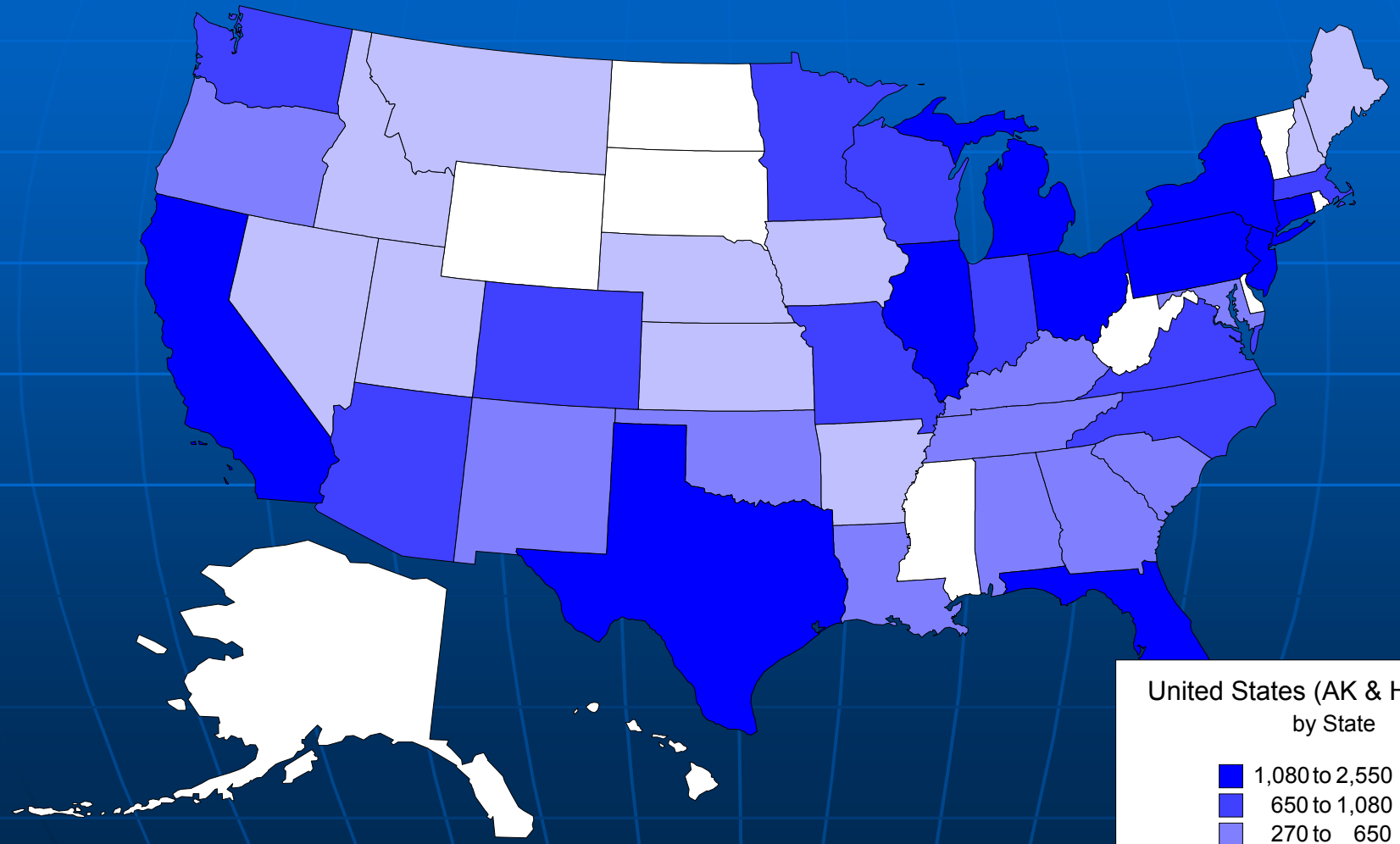
Publications on NARCOMS data (2002-2004)

- Fraser, C., Hadjimichael, O., & Vollmer, T. (2003). Predictors of adherence to Copaxone therapy in individuals with self-reported progressive forms of multiple sclerosis. *Journal of Neuroscience of Nursing*.
- Hadjimichael, O. (2004). Use of rehabilitation services reported by NARCOMS registrants. *MSQR, 23, 1, 21-23*.
- Lo, A., Hadjimichael, O., & Vollmer, T. (2004). Treatment patterns of multiple sclerosis patients: A comparison of veterans and non-veterans using the NARCOMS registry. *Multiple Sclerosis, 23, ??, pp ??*
- Marrie, R.A., Cutter, G., Tyry, T., Hadjimichael, O., & Vollmer, T. (2004). Validation of the NARCOMS Registry: Pain Assessment". Submitted to *Multiple Sclerosis*.
- Marrie, R.A., Hadjimichael, O., & Vollmer, T. (2003). Predictors of alternative medicine use by multiple sclerosis patients. *Multiple Sclerosis, 9, 5, 461-466*.
- Rizzo, M., Hadjimichael, O., Li, J., Preningerova, J., & Vollmer, T. (2004). Prevalence and treatment of spasticity reported by multiple sclerosis patients. *Multiple Sclerosis, 23, 10, 589*.
- Rizzo M. Hadjimichael O. Buenconsejo J. Preningerova J. Vollmer TL. P191 Spasticity in MS Patients In The NARCOMS Registry: Prevalence, Severity and Treatment Patterns Using Oral Agents And/Or Intrathecal Baclofen. *Multiple Sclerosis Clinical and Laboratory Research*. September 2002. 8(1):S80
- Vollmer, T., Hadjimichael, O., Preningerova, J., Ni, W., & Buenconsejo-Singuego, J. Disability and Treatment Patterns of Multiple Sclerosis Patients in the USA: A Comparison of Veterans and Non-veterans. *Journal of Rehabilitation Research and Development*. 2002 39:2 163-174

Last Years Accomplishments

- Publications: 5 manuscripts accepted for publication in 2005-06
- 1 manuscript submitted to *Archives in Neurology*
- Presentations: 2 AAN annual conference
- 4 abstracts CMSC annual conference
- Projects: 11 research/recruitment projects in progress or completed since 10/2005
- 12 research/recruitment projects in planning stages or pending funding

United States (AK & HI Inset)



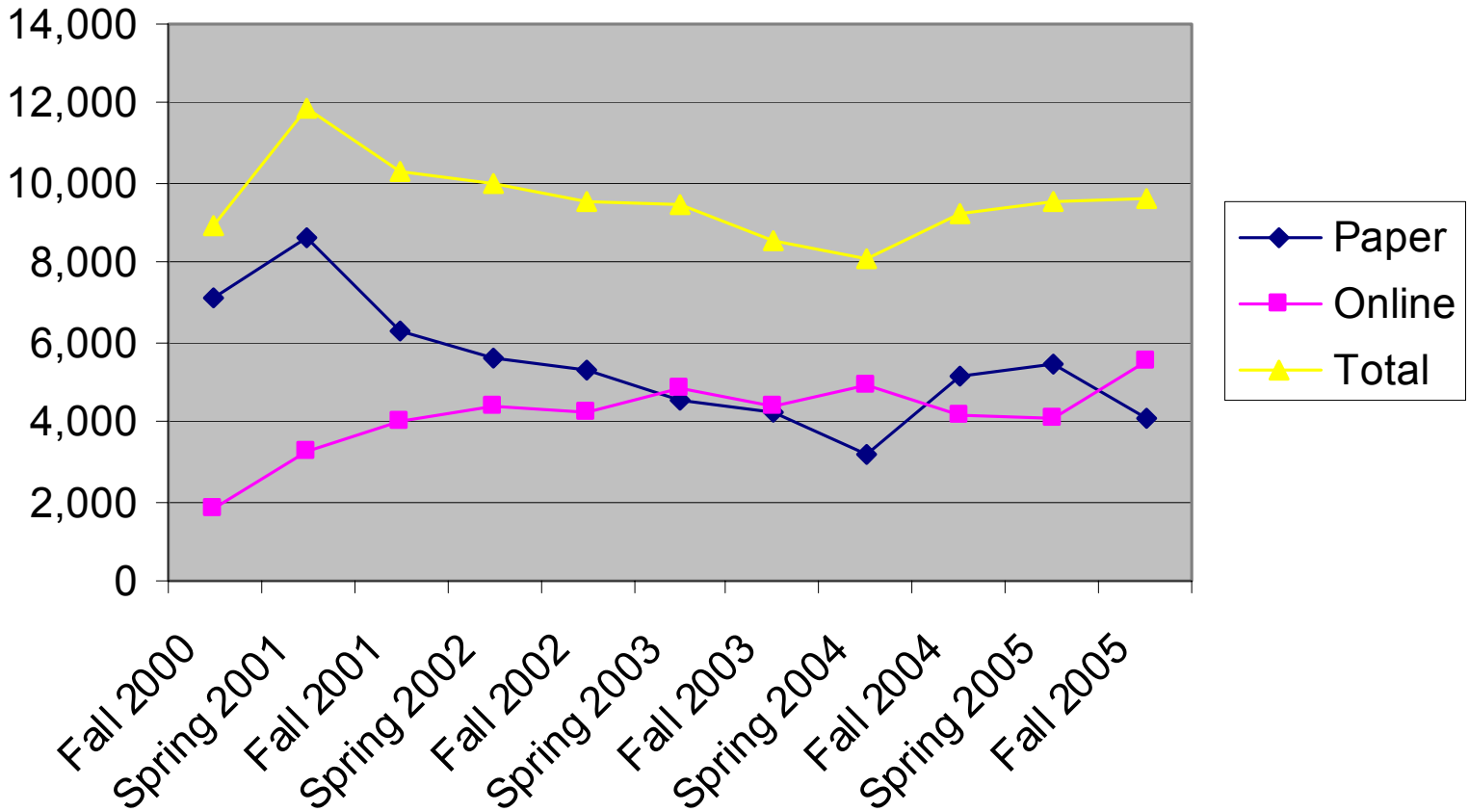
- Timothy Vollmer, MD – Co-Investigator
- Denise I. Campagnolo MD,MS – Medical Director
- Tuula Tyry, PhD, MAED – Program Manager
- Nancy Silingo – Research Assistant
- Breana Bullock – Data Analyst
- Gary Cutter, PhD
 - Contracted statistical support
- Ruth-Ann Marrie, MD
 - Fellow

Active Participants and New Enrollments

- 18,081 - Total active participants as of March 2006 (“active” = alive and responding)
- 1,559 – Total new enrollments in 2005
 - Majority are on-line participants
- 17,142 – Total update questionnaires sent out in Fall 2005
 - 2/3 electronically
- Response rate: $9,679 / 17,142 = 56.5\%$ overall
- Only domestic updates mailed

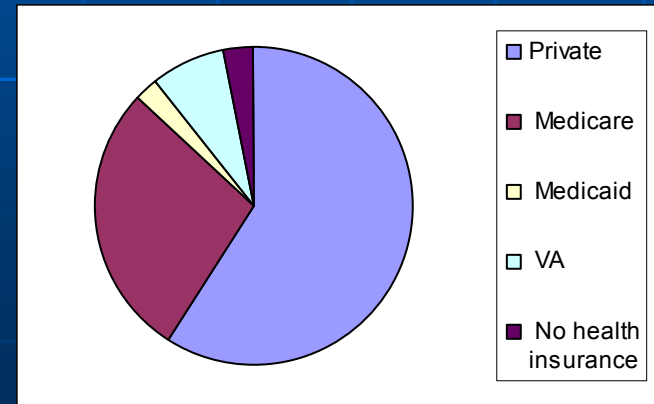
Online versus Paper responses

Number of responses 2000 - 2006



Snapshot 2005 (n=30,833)

Sex			
	Women	22,334	72
	Men	8,499	28
Age			
	Under 35	1,969	6
	35-44	6,221	20
	45-54	10,667	35
	55-64	8,150	27
	65 or older	3,767	12
Race/Ethnicity			
	White non-Hispanic	26,888	87
	African American	1,332	4
	Hispanic	591	2
	Native American Ind	309	1
	Other or unknown	1,713	6

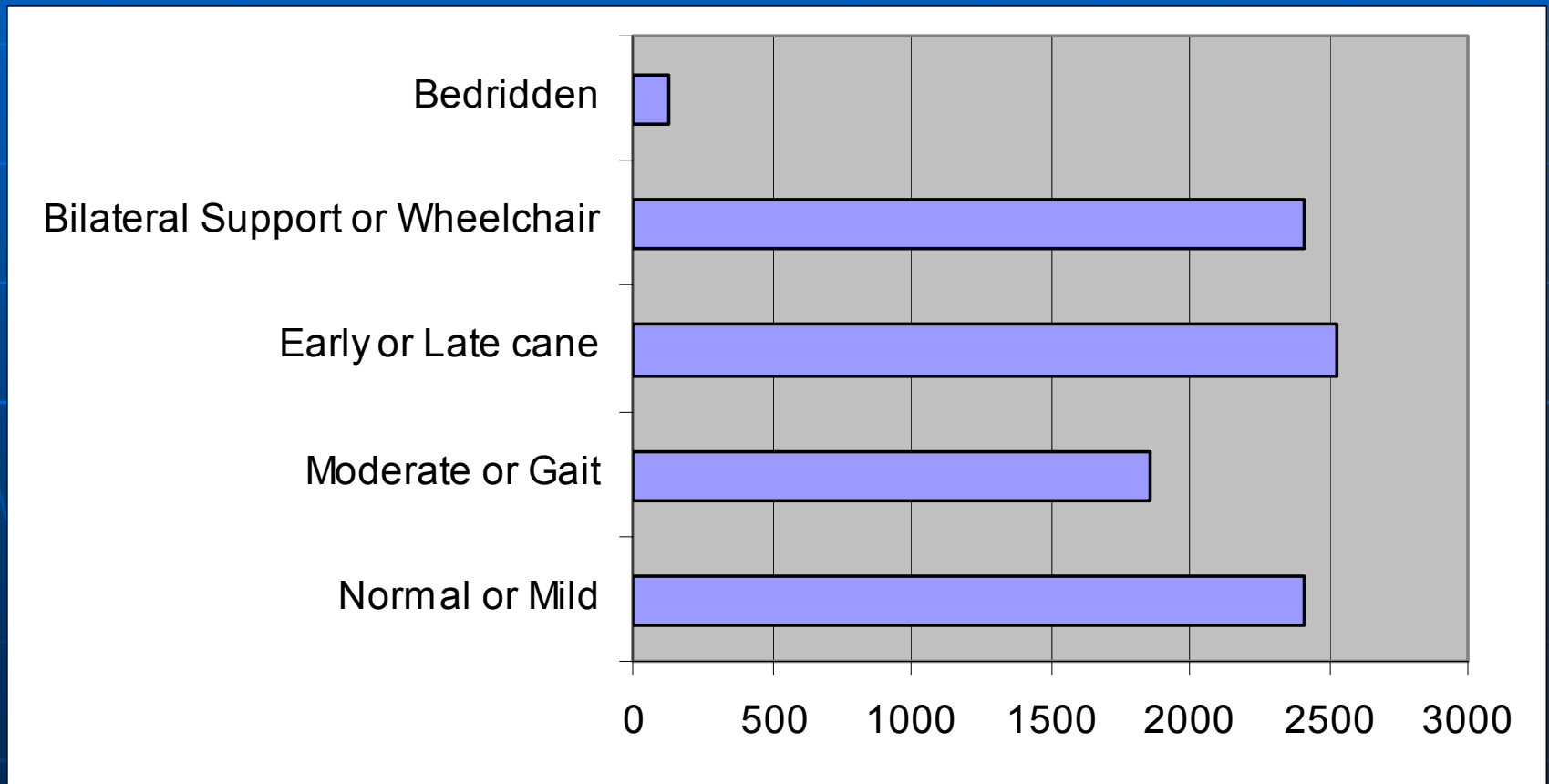


Characteristics of Patients by MS Subtypes

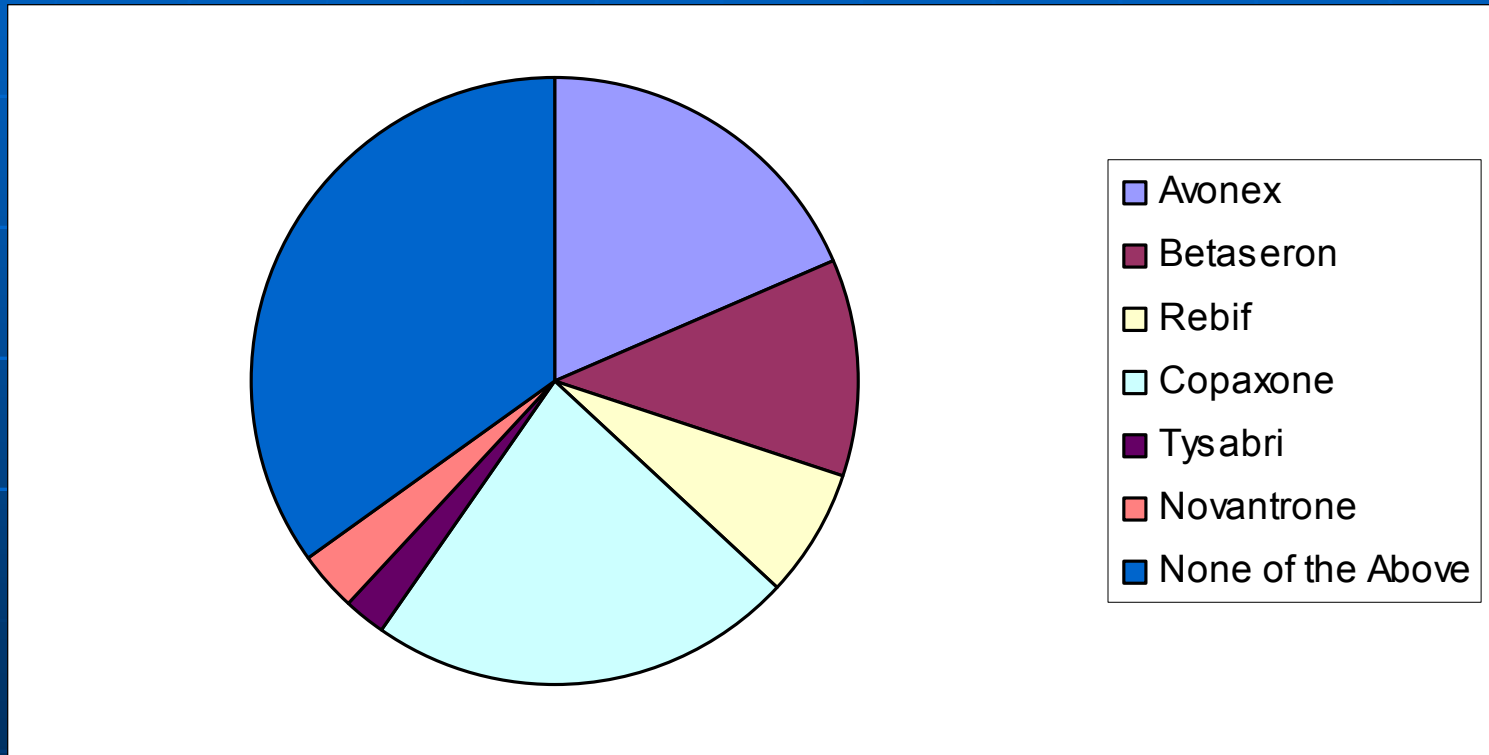
(based on 2003 data)

	Currently Relapsing		Past Relapsing		No Relapses
	Stable	Worsening	Stable	Worsening	PP
N	4,955	10358	1,287	1,237	1,767
	25%	53%	7%	6%	9%
Demographics					
Female:	80.1	72.2	72.7	64.6	60.7
Age Mean (sd)	47 (10.5)	49 (10.4)	53 (10.5)	55 (9.6)	54 (11.3)
Age of diagnosis	35.7	36.6	34.6	35.7	41.0
Length of disease (sd)	10.7	10.9	17.4	17.5	12.1
Race					
Caucasian	90.8	91.0	93.6	93.3	92.6
African-American	4.5	4.0	3.4	3.5	3.8
Education:					
Bachelors or higher	42.0	36.4	46.0	42.6	43.4
Employment					
Employed	50.3	39.4	46.4	32.4	39.4
Retired	5.7	7.1	13.1	16.4	17.7
Disabled	30.6	39.4	27.8	41.1	32.3
Insurance					
Medicare /Medicaid	18.5	24.3	21.1	32.3	26.0
Private/Comm'l	67.5	57.4	62.2	47.0	54.2
No Insurance	2.1	3.4	1.2	2.8	1.9
Income <50K	59.3	66.1	60.5	60.4	62.8

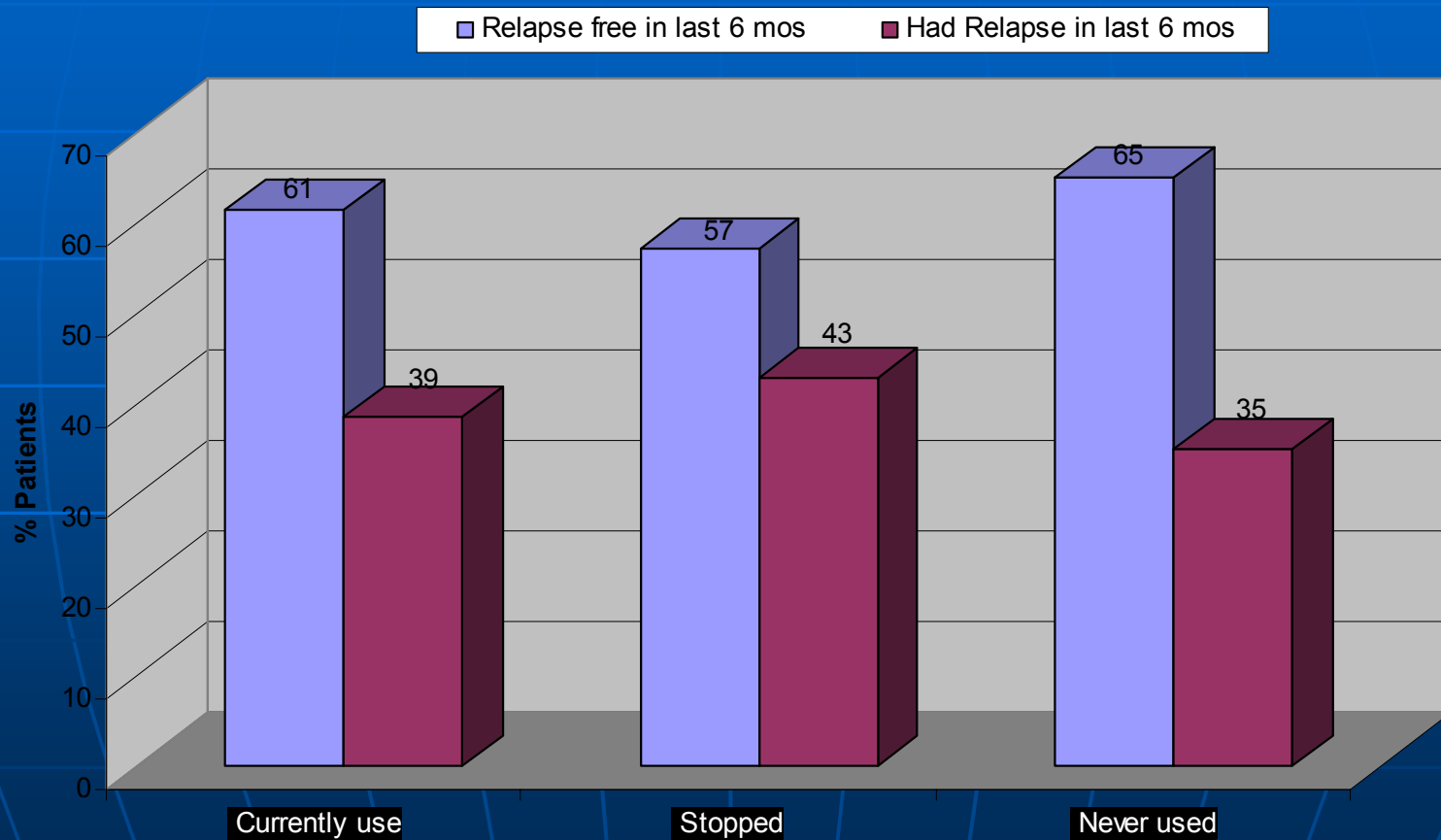
Patient determined disease step (PDDS) scores and treatment status among the Spring 2005 update U.S. responders (n=9,471)



DMA Usage amongst the Spring 2005 update U.S. responders (n=9,471)



Relapse in Past 6 Months by Treatment Status (based on 2003 data)



Example of an online study: Using NARCOMS registry to reach care-partners

- Fast and cost-effective way to reach thousands of care-partners
- Use of online survey makes it convenient for participants and researchers
- Challenges:
 - IRB issues, informed consent
 - Potential bias against “Internet have-nots”

Training /Fellowship Opportunities

- Funded through the CMSC
- Ruth-Ann Marrie, MD
Fellow - 1 year appointment (7/2005 – 6/2006)
- Goal of the fellowship is to provide protected time to conduct research and publish manuscripts based on the data from the Registry

MSQR

- United Spinal Association produces a quarterly newsletter/journal
- Narcoms Reports
- Breaking News
- Current Clinical Trials in MS
- Narcoms Information Corner

