NATIONAL MS SOCIETY: ASSESSMENT

OVERVIEW

This section provides an assessment of the Society's operations and research portfolio. It is based on a set of metrics developed by *FasterCures* to assess practices and attributes of nonprofit disease research groups that contribute to the acceleration of high-impact biomedical research. While these areas of assessment are believed to contribute to accelerating research, it should not be assumed that all organizations will exhibit all of these practices and attributes. Each organization's assessment is made within the context of its stated strategies and mission as well as the research needs within the specific disease. In addition, this section also highlights how the Society's efforts respond to the needs of the research community as identified in the PAS disease report on MS.

ASSESSMENT RESULTS

The metrics used for the assessment are organized into four primary groups:

- **Accountability:** The degree to which an organization engages in planning, demonstrates transparency, and upholds stakeholder responsibility
- **Collaboration:** The degree to which an organization can engage and nurture relationships that accelerate the overall funding and research cycle
- **Research Effectiveness:** The degree to which the organization's research portfolio yields sufficient data and deliverables in alignment with its stated mission
- **Resource Building:** The degree to which the organization contributes critical resources and infrastructure to the greater scientific community

Several metrics are included in each assessment category. The *assessment* reflects *FasterCures*' evaluation of the organization's performance for that metric and the *results* color indicates the quality of performance.

- **OUTSTANDING** performance
- **STRONG** performance
- **ACCEPTABLE** performance
- Performance **NEEDS IMPROVEMENT**

Accountability: Accountability refers to the degree to which an organization engages in planning, demonstrates transparency, and upholds stakeholder responsibility.

Metric	Results	Assessment
Strategic Planning and Monitoring	**Strong**	The Society formulates its organizational strategy every three years, through a rigorous process that incorporates input from a large group of constituents, which helps to ensure they are addressing their needs. The Society also regularly reviews its grant programs using metrics tailored to the goal of each program, a good practice given that some of its grant mechanisms have very specific goals. In addition, the Society is upgrading to a more effective mechanism for tracking the progress of its activities against its goals.
Milestones	**Strong**	The grants funded by the Society are subject to an annual interim review, and grants that do not make reasonable progress may be terminated. Some clinical research grants and healthcare delivery and policy grants are subject to additional pre-determined milestones. Given that most of the Society's grants are investigator-

Metric	Results	Assessment
		initiated, it is difficult to directly tie the achievement of the specific aims of individual grants to the organization's strategy, beyond research advancement and career development. However, the Society also invests a sizeable share of its research budget in Targeted Initiatives, in which case the achievement of aims can be linked directly to the achievement of a larger goal.
Advisory Boards	**Strong**	In addition to the National Board of Directors, the Society convenes multiple advisory boards to solicit expert input. The RPAC is the main standing advisory body that provides input on its overall research operation, and additional ad hoc committees and taskforces are established for specific issues or initiatives. In addition to RPAC, the National Clinical Advisory Board provides input on clinical issues.
Intellectual Property (IP)	**Acceptable**	The Society relies on the IP policies of the grantee organizations, but requires them to report on IP right creation and to pursue commercialization. This policy is generally aligned with the Society's programs, similar to policies of peer organizations, and easily operationalized within the existing challenges of the university technology transfer environment. The Society is commended for their enforcement of the policy to ensure their rights are protected as defined in their policy. Opportunities exist for the Society to better understand the potential for policy and procedural changes to more effectively share IP with the broader MS community.

Collaboration: Collaboration refers to the degree to which an organization can engage and nurture relationships that accelerate the overall funding and research cycle.

Metric	Results	Assessment
Industry Partnerships	**Outstanding**	Fast Forward, launched in 2007, actively seeks opportunities to fund industry-based drug development efforts. Fast Forward aims to accelerate MS drug development by providing funding to drug development projects in academia and early-stage biomedical companies. In addition to announcing its first deal in December 2008, Fast Forward also entered into a collaborative agreement with EMD Serono, to which the company has contributed up to $19 million. At the same time, PAS' scientific advisors expressed concern that a focus on commercialization could hinder the Society's capability to fund basic science research, so maintaining strength in both areas will be an important measure of success for the Society.
Knowledge-sharing	**Strong**	The Society contributes to knowledge sharing in MS research by organizing Task Forces and Workshops on specific issues, which has been very effective in bringing MS researchers together, as well as in providing support for scientific meetings organized by other entities. In addition, the Society launched its Tykeson Fellowship Conference in 2008, which all training award recipients are required to attend to increase knowledge sharing, build a community of MS researchers, and interact with patients. Such efforts could be expanded across its research programs.
Team Science	**Strong**	The Society's Collaborative MS Research Center Award was specifically put in place as a strategy to increase collaboration in MS research, based on a recommendation of an IOM review of MS research. In addition, many of the organization's Targeted Initiatives are large-scale projects structured as team grants with multiple collaborators. In total, about 20 percent of the Society's active portfolio is composed of team grants, reflecting the Society's emphasis in this area, although additional resources could be invested in this area.

Metric	Results	Assessment
Global Research	**Outstanding**	The Society's grant programs are open to researchers in the United States and overseas, and approximately 10 percent of active grants are disbursed to researchers in other countries, including grants for targeted initiatives. In addition, the Society engages international scientists in various aspects of its research operations, including its Scientific Workshops, study groups, and advisory committees. One notable international effort is the Atlas of MS, an international survey done in conjunction with the WHO to collect data on disease prevalence for over 88 percent of the world's population.

Research Effectiveness: Research effectiveness refers to the degree to which the organization's research portfolio yields sufficient data and deliverables in alignment with its stated mission.

Metric	Results	Assessment
Scientific Advancement	**Strong**	PAS's scientific advisors point out that the Society has been the single organization serving as a catalyst for new research in MS. This contribution to science is made through the Society's research funding as well as its Scientific Workshops, which raise awareness in the scientific community about new research areas. The organization could further track the outcomes of the research projects against a research plan to demonstrate how the funded research is advancing the Society's strategic goals.
Portfolio Congruence	**Strong**	The Society's research strategy focuses on accelerating research toward a cure by increasing collaboration and providing support for under researched and promising areas. The Collaborative Center Awards, the Pilot Awards, and the targeted RFPs are mechanisms specifically designed to address these focus areas, which amount to over 20 percent of the active portfolio. The Society's research portfolio is balanced between etiology and treatment research, and the PAS SAB believes that the Society's portfolio is consistent with what is required given the status of research, with additional focus on psychosocial aspect of the disease.
Knowledge Production	**Strong**	The Society is a key source of new knowledge about MS. Internal tracking of publications of its grantees indicates that a typical grant results in 4-6 publications, and that in 2008, research grants resulted in 240 publications. The Society has also calculated that in 2006 – 2008, 67 percent of the applications reviewed were from investigators who had written their proposals based on data produced from previous Society grants indicating contribution of new knowledge to the field. The Society could to benefit from tracking publications electronically and systematically tracking the quality of its publications.

Resource Building: Resource building refers to the degree to which the organization contributes critical resources and infrastructure to the greater scientific community.

Metric	Results	Assessment
Tools/ Resources Development	**Strong**	The Society has provided support for multiple tissue banks in MS, an important resource for research on the pathology of the disease. In addition to providing financial support, the Society also ensures the compatibility of sample collection procedures by requiring all banks to use the same collection methodology, which is important for research using biospecimens. In addition, the Society contributes to generating research data accessible to the research community, including its support of the genetic data repository of the MS Genetics Group at the

Metric	Results	Assessment
		University of California, San Francisco and its collection of quality of life data through its Sonya Slifka Longitudinal Study in the United States. At the same time, the Society is at a unique position to contribute to the field in this area, calling for additional responsibility.
Research Training	**Outstanding**	Providing funding to build the next generation of MS researchers is an important mission of the Society, and among the active grants issued since 2005, 12 percent focus on providing career development opportunities to postdoctoral fellows or equivalent and to young investigators. The PAS SAB notes that the Society's support for young investigators has been crucial in research training and that the majority of leading researchers today were past recipients of the Society's career development grants.
Patient Organization	**Strong**	The Society is advocating for passage of the National MS Disease Registry Act in Congress, which aims to create a National MS Registry at CDC. The registry is expected to contribute to better understanding of the epidemiology and causes of MS, and also complement the existing patient registry maintained by the Consortium of MS Centers. However, given the unique position that the Society has in terms of patient access, the Society can make an important contribution in executing such efforts, so it will be interesting to see the role it will play in building the registry.
Clinical Trials Networks	**Strong**	The Society has funded the establishment of MS-CORE, a clinical trial network of 80 sites. Although the network is yet to be widely used, it will help facilitate clinical trials, especially those sponsored by agents other than the pharmaceutical industry.

The National MS Society was not assessed against the following metrics as they are not aligned with the organization's stated strategy:

1. Pipeline Profile

SCIENTIFIC CONTRIBUTION

This section highlights the National MS Society's scientific contributions to the research community, focusing on how it is contributing to addressing the challenges facing the research community. The Society's specific ongoing contributions are summarized below:

Spectrum	Scientific Contribution
Care Continuum	
Disease Understanding	**Limited understanding of the causes of the disease** is an underlying challenge in MS research, and the Society's research funding, with *almost half of it directed to etiology research*, contributes to progress in this area. In addition, the Society's MS Lesion project focuses on understanding the difference in clinical disease by researching the patterns of MS lesions in different patients. This project is likely to contribute to **better understanding of the drivers of disease progression** as well as the **differences among disease subtypes.** Additional areas are identified as major areas requiring investment, and this project has the potential to greatly advance science in MS.
Prevention	**Better understanding the role of vitamin D and it potential in prevention** approaches requires research attention. The Society has *an investigator-initiated grant directly addressing this issue*. In addition, the Society's research on risk factors and epidemiology will contribute to the development of treatment measures in the long run.
Diagnostics	Major challenges to development of diagnostics and disease markers for MS include the lack of tools to **monitor disease activities** as well as **tools to**

Spectrum	Scientific Contribution
	measure disease progress and treatment effectiveness, including neurodegeneration and neuronal repair. The Society has issued a number of investigator-initiated grants focused on disease markers. In addition, the *Nervous System Repair and Protection Initiative*, described more in detail in the treatment section, includes research to develop markers to measure treatment effectiveness, including improved imaging technology to detect myelin and nerve fiber damage and repair, which could contribute to **direct observation of myelin**.
Treatment	**Treatment research focusing on neuronal repair and neuroprotection, in addition to strategies focusing on inflammation**, were identified by PAS's scientific advisors as areas needing more investment. The Society's *Nervous System Repair and Protection Initiative*, an investment of more than $15M plans to enable clinical trials by 2010. Scientists have highlighted the potential impact of this project to the MS research field overall. In addition, another area needing research investment is **more effective symptomatic treatment**. The Society's research strategy calls for focus on all aspects of treatment, *including stopping MS attacks and disease progression, repairing the damage from the attacks, preventing the onset of the disease, as well as quality of life issues such as policy and delivery, rehabilitation, symptom management, and psychosocial research*. As such, the research projects funded by Society span these areas.
Delivery	The **high cost of treatments and access to specialists** is a major issue for MS patients, though not an issue directly linked to research. Through the *Sonya Slifka Longitudinal Study*, the Society collects data on quality of life, rehabilitation, symptomatic therapies, employment, and healthcare delivery. These data will be leveraged to develop strategies for the Society's own advocacy efforts, and will be made available for use by researchers. In addition, the Society's *advocacy and patient support activities* directly help address this challenge.
Research Tools	
Biospecimens and Data	**The small number of samples, limiting the power of analyses, and difficulties caused by differences in collection protocols** are some of the major challenges facing the use of biospecimens in MS research. The Society has *funded three biospecimen repositories for MS research*, including the Human Neurospecimen Bank at the University of California, Los Angeles; the Rocky Mountain MS Tissue Bank; and the recently established University of Illinois at Chicago MS Tissue Repository. In addition, the Society specifically required the biospecimens repository at the University of Illinois to collaborate with the existing repositories to *ensure that the tissues are collected in a compatible manner*.
Clinical Trials	As treatment options have been introduced in MS, **placebo-controlled trials have become increasingly difficult to conduct**. The *International Advisory Committee on Clinical Trials*, convened by the Society, discusses and seeks solutions to issues related to trial design and outcome measures.
Animal Models	The **EAE model, the dominant animal model in MS research, focuses only on the immunologic aspects of the disease**, and therefore is not adequate for research focused on other aspects of the disease. Through its investigator-initiated grant mechanism, the Society has funded *grants aiming to validate animal models that allow investigations beyond immunology,* such as axon degeneration.
Research Training	The limitations in **multidisciplinary talent** and lack of **young investigators with an interest in a career in MS research** are major challenges for MS research community. The Society addresses these by establishing grant programs designed to meet these needs, including its *Collaborative Center Awards and Pilot Awards* that seek to attract scientists from other fields as well as its *Career Development Awards*.

NATIONAL MS SOCIETY: ACRONYMS

ACTRIMS: Americas Committee on Treatment and Research in Multiple Sclerosis
CDC: Centers for Disease Control and Prevention
CSF: Cerebrospinal fluid
IP: Intellectual property
IRC: Information Resource Center
MS: Multiple sclerosis
MS-CORE: Multiple Sclerosis Cooperative Research Group
NCAB: National Clinical Advisory Board
NIH: National Institutes of Health
NINDS: National Institute of Neurological Disorders and Stroke
PRC: Professional Resource Center
RFP: Request for Proposal
RPAC: Research Programs Advisory Committee
SBAC: Science and Business Advisory Board

RESEARCH PORTFOLIO

GRANT OR PROJECT TYPE

- **Research**: The systematic process of collecting and analyzing information to increase our understanding of the phenomenon under study. It can be hypothesis-driven, problem-oriented, or discovery-based. It can be conducted by a single investigator or multiple investigators, and at single or multiple sites. A project should be defined with an expected goal.
- **Training**: The systematic process of developing knowledge, skills, and attitudes for current or future jobs. Sometimes used interchangeably with "education." In the sciences it typically occurs at the postdoctoral level, or as part of career advancement. Predoctoral education is sometimes called training. Training grants can be made to individuals or institutions. The funds are supporting the training, not any research that might be conducted as part of the training. For example, someone might have a postdoctoral fellowship, which is training, but be working on a research project funded by a grant submitted by the principal investigator. Excludes K-12 science education.
- **Tools/resources**: Support for infrastructure, sometimes called "cores." It can include databases, tissue banks, information technology, statistical centers, equipment, technology, support staff (administrators, librarians). In most cases they will be resources or tools that are shared but can sometimes be needed for a specific project. Not to be confused with the purchase of equipment as part of a research grant.
- **Policy/delivery**: Includes health services research, policy studies, and can include surveys (e.g., attitudinal, delivery related).

TYPE OF RESEARCH

- **Etiology**: The study or theory of the factors that cause disease.
- **Prevention**: The study of factors that can thwart the onset of disease (e.g., diet, behavior change, dietary replacements or supplements).
- **Diagnosis**: The development of tools that can be used to detect and/or diagnose disease (e.g., blood tests, biomarkers, imaging techniques).
- **Treatment**: Research aimed at the deliberate alteration of the chemical and/or physical aspects of the biological system. Treatment studies can be aimed at stabilization and/or restoration of health.
- **Other**: Any research not included in previous categories.

STAGE OF RESEARCH

- **Basic**: Systematic study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind.
- **Translational**: Outcome-focused research where a problem or obstacle has been identified. Translational research takes what is known and calculates what studies still must be done to answer a question or solve a problem. It can include basic studies that are focused on a well defined problem, but it does not include clinical studies involving interventions in human populations. In some cases, it can involve the analysis of human biological materials (e.g., blood, tissue, tumors)
- **Clinical**: Clinical research generally refers to the study of a drug, biologic, device, or other intervention in human subjects with the intent to discover potential beneficial effects and/or determine safety and efficacy. It also refers to studies of human populations (e.g., epidemiology, behavior, observation). Also called clinical study and

clinical investigation. It is not necessarily synonymous with the regulatory definition of human subjects research. (See 45 CFR 46.102(f).)

- **Other**: Any research not included in previous stages.

MANAGEMENT

- **Medical research industry:** Pharmaceutical, biotechnology, or medical device companies that may serve as an industry partner to the organization. This category does not include payors or providers.
- **Nonprofit research funders and advocacy groups:** Nonprofit organizations funding research in any diseases and organizations focusing on advocacy activities in the given disease.
- **Nonprofit and clinical research institutions:** Institutions where research is conducted, including academia, independent research centers, and hospitals, including Veterans' Affairs medical centers.
- **Government and multilateral research entities:** Initiatives or sub-units within government entities on the national and international levels pertinent to the focus disease; examples include the Food and Drug Administration, units under the National Institutes of Health, and the World Health Organization.
- **Research infrastructure providers:** Entities that provide tools and resources for research. Examples include biospecimen repositories, clinical trial networks, or data repositories, but exclude hospitals.

FINANCIALS

- **Direct public support:** Contributions, gifts, and similar amounts received directly from the public. Can be cash or in-kind and be raised by the organization itself or by a third party (except federated agencies). If the latter, the full amount raised (not the amount the organization actually received) should be included. Membership dues and assessments that are more of public contribution than payment for benefits received or payment from affiliated organizations should be included in public support. Contributions by a commercial co-venture and contributions raised through special events are also included here.
- **Funds raised**: Sum of public support, government contributions, and income from special events and activities.
- **Gross profit or loss from sales of inventory**: Gross profit or loss from the sale of inventory items, excluding those sold at special events. Sales of investments on which the organization expected to profit by appreciation and sale are not reported here.
- **Indirect public support:** Contributions received indirectly from the public through solicitation campaigns conducted by federated organizations (e.g., United Way). Contributions by closely associated organizations (e.g., parent organization, affiliate) are also included here.
- **Income from assets:** Income derived from financial and nonfinancial assets. This includes interest income, net rental income, dividends, other investment income, and net gain or loss from sales of assets other than inventory.
- **Income from program services and sales:** Income from "Program service revenue including government fees and contracts" and "Gross profit or loss from sales of inventory."
- **Program service revenue including government fees and contracts:** Income from activities that form the basis of an organization's exemption from tax. Income from program-related investments (e.g., scholarship loans) should also be included in this category.