



National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)

2015 REPORT TO CONGRESS

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Acronyms

ACL	Administration for Community Living
ADA	Americans with Disabilities Act
ADA-PARC	ADA Participatory Action Research Consortium
APR	Annual Performance Reporting Data System
ARRT	Advanced Rehabilitation Research Training Project
BMS	Burn Injury Model Systems
CESD-10	Center for Epidemiological Studies Depression Scale-10
DRRP	Disability and Rehabilitation Research Project
ED	Department of Education
FCC	Federal Communication Commission
FIP	Field-Initiated Project
FY	Fiscal Year
HHS	Department of Health and Human Services
ICDR	Interagency Committee on Disability Research
IDD	Intellectual and Developmental Disabilities
LLC	Limited Liability Company
MIT	Massachusetts Institute of Technology
NIDILRR	National Institute on Disability, Independent Living, and Rehabilitation Research
OT	Occupational Therapy
PHQ-9	Patient Health Questionnaire-9
PROMIS-D-8	Patient-Reported Outcomes Measurement Information System Depression Short Form
RERC	Rehabilitation Engineering Research Centers
ROI	Return on Investment
RRTC	Rehabilitation Research and Training Centers
SBIR	Small Business Innovation Research
SDCDM	Self-Determined Career Development Model
SCI	Spinal Cord Injury
SCI-FI / AT	Spinal Cord Injury-Functional Index Computer / Assistive Technology
SCIMS	Spinal Cord Injury Model Systems
SW	Shear Wave (SW)
TBI	Traumatic Brain Injury
TBIMS	Traumatic Brain Injury Model Systems
UTEP	University of Texas – El Paso
VA-DARS	Virginia Department of Aging and Rehabilitation Services
WIOA	Workforce Innovation and Opportunity Act
W-MAT	Wheelchair Maintenance Assessment Tool

Executive Summary

The National Institute on Disability, Independent Living, and Rehabilitation Research's (NIDILRR) mission is to generate new knowledge and to promote its effective use to improve the abilities of individuals with disabilities to perform activities of their choice in the community, and to expand society's capacity to provide full opportunities and accommodations for its citizens with disabilities.

NIDILRR programs address a wide range of disabilities and impairments, across all age groups, and promote health and function, community living and participation, and employment. To accomplish these goals, NIDILRR invests in research, knowledge translation, and capacity-building activities through its discretionary grant-funding mechanisms.

Funding and Grants Management

The allocation of NIDILRR grant funds for FY 2014 and FY 2015 totaled \$98,013,248 and \$95,769,377, respectively. In addition, NIDILRR awarded \$5,956,752 in contracts and other support activities for FY 2014 and \$8,200,623 in FY 2015. These funds supported 223 grant awards in 2014 and 218 in 2015.

NIDILRR's peer review process for grant competitions is highly rigorous, with approximately one-quarter of applicants awarded funding during FY 2015. NIDILRR's peer review process includes members of the disability community and other stakeholders on its review panels.

Productivity and Accomplishments

NIDILRR sponsors the development of new knowledge and innovative new technological devices, prototypes, measurement tools, intervention materials, and other informational products to enhance community living. Grantees employ an assortment of methodologies to conduct research and develop new products and technologies, including randomized controlled trials, longitudinal studies, qualitative studies, and intervention studies. These approaches and investments generated more than 1,200 products, including peer-reviewed publications, intervention protocols, software, and databases.

Selected examples of NIDILRR grantee accomplishments in FY 2015 include:

- A diabetes education tool kit for persons with mental health disorders.
- A virtual vocational rehabilitation resource for individuals with disabilities in rural communities.
- A revolutionary walker that helps individuals come to a standing position.
- New standards for the performance of handsets and hearing devices.
- A device that converts digital data into audiovisual form.
- Integrated technology for teachers to aid in providing tailored accommodations for testing.
- A Web-based program on interpersonal violence for men with disabilities.
- New solutions for delivering Medicaid support services to children with autism.
- A comprehensive tool to assess functional changes in persons with spinal cord injury.
- A robotic arm that reduces the weight-bearing load for caregivers with transfers to and from wheelchairs.
- A study on the factors affecting community participation in persons with chronic pain.

- An examination of state policies influencing the implementation of home and community-based service waivers for people with autism and their families.
- Studies concerning the Return on Investment (ROI) of vocational rehabilitation services.

Research Capacity Building

Research capacity-building efforts under the Advanced Rehabilitation Research Training Projects (ARRT) and Switzer Fellowship Program continue to train a diverse cadre of disability and rehabilitation researchers, to serve as leaders in the disability research community. In FY 2015, 87 ARRT Fellows and 15 Switzer Fellows worked on independent and partnered projects with mentors at prominent research institutions. In recent years, NIDILRR has developed and implemented a program to build disability and rehabilitation research capacity among minority-serving institutions, such as Historically Black Colleges and Universities and Tribal Colleges and Universities and has targeted grant opportunities for applicants from minority-serving institutions.

Training and Technical Assistance on the Americans with Disabilities Act (ADA)

NIDILRR sponsors the ADA National Network, which delivers training, technical assistance, and dissemination of materials for stakeholders with rights and responsibilities under the ADA. The Network provides expert training, technical assistance, and materials to the public and employers in the private and public sectors through its 10 regional centers. In FY 2015, the Network responded to almost 60,000 inquiries by phone, email, or in person. The ADA Participatory Action Research Consortium (ADA-PARC) complements the Network's activities through research on factors influencing the community living of citizens with disabilities and health disparities, and assessments of promising practices at state, regional, and community levels.

Knowledge Translation

NIDILRR is committed to ensuring that the products of the research and development that it sponsors are translated and used to promote the independent living, health and function, employment, and community living outcomes of individuals with disabilities. Through its Knowledge Translation Centers, NIDILRR ensures that new knowledge and products gained through research and development are effectively communicated to stakeholders and used to improve the lives of individuals with disabilities.

Future Directions

Looking forward, NIDILRR is focused on finalizing its transition from the Department of Education (ED) into the Department of Health and Human Services' (HHS) Administration for Community Living (ACL), enhancing its current partnerships within the disability and rehabilitation research communities, and sponsoring research of the highest quality in support of those communities.

In alignment with these priorities, NIDILRR will soon begin development of its FY 2018–2022 Long-Range Plan to define its organizational and programmatic vision. Planned activities for the development of the

document include the convening of internal work teams and the Disability, Independent Living, and Rehabilitation Research Advisory Committee to assess the current and emerging state of the science, and otherwise inform the development of strategic goals and objectives for the organization. NIDILRR will systematically seek participation from staff, ACL colleagues, federal partners, and stakeholders in the long-range planning process. In parallel to the work on the long-range plan, NIDILRR will conduct a review of its administrative management, and programmatic policies, procedures, and practices with the goal of optimizing organizational efficiency and effectiveness.

Strategic partnerships with other agencies in HHS and across the federal government have been instrumental in advancing NIDILRR's mission. NIDILRR's Director serves as the Chair of the Interagency Committee on Disability Research (ICDR). The ICDR mission is to promote a cohesive, strategic federal program of disability, rehabilitation, and independent living research and to facilitate coordination and collaboration among federal departments and agencies. NIDILRR plans to build upon the ongoing work of the ICDR through its leadership and contribution to the development of a government-wide disability and rehabilitation research strategic plan. The new ICDR strategic plan will define a way forward for promoting and expanding collaboration among federal partners, researchers and developers, and the disability community at large.

National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) 2015 Report to Congress

Introduction

Throughout its history, the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) has sought to improve independent living and community participation by funding research and development in the areas of community living and participation, health and function, and employment. This Annual Report to Congress will describe NIDILRR's execution of these principles during the 2014 and 2015 fiscal years. It begins with a brief summary of NIDILRR's history, continues with a description of its funding process and fiscal allocations, and follows with descriptions of outcomes impacting the community, highlighting a number of accomplishments by researchers and organizations funded by NIDILRR. This report concludes by describing future initiatives and directions within the organization.

Congress established NIDILRR in response to a deficit of knowledge on the needs of and services for individuals with disabilities across the lifespan. NIDILRR was established as the National Institute on Handicapped Research (NIHR) by the Rehabilitation, Comprehensive Services, and Developmental Disabilities Amendments of 1978 (P.L. 95—602), amending the Rehabilitation Act of 1973, and initially housed within the Department of Education (ED). Its original goal was to carry out research on all aspects of disability and the socio-economic implications of the problems encountered by individuals with disabilities. The 1986 amendments to the Rehabilitation Act (P.L. 99-506) changed the agency's name to the National Institute on Disability and Rehabilitation Research (NIDRR). On July 22, 2014, the agency was renamed the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) and transferred from ED to the Administration for Community Living (ACL) within the Department of Health and Human Services (HHS) by the signing of P.L. 113-128, the Workforce Innovation and Opportunity Act (WIOA). NIDILRR personnel officially became HHS/ACL employees on February 8, 2015.

Today, NIDILRR's mission is to generate new knowledge and promote its effective use to improve the abilities of individuals with disabilities to perform activities of their choice in the community, and to expand society's capacity to provide full opportunities and accommodations for its citizens with disabilities. To accomplish this mission NIDILRR:

- Supports research, development, demonstration, training, technical assistance, and related activities to build new knowledge.
- Promotes the transfer, use and adoption of technology for individuals with disabilities to improve independent living options.
- Provides for research training to increase the number of qualified researchers, including researchers with disabilities and from minority backgrounds.

- Fosters widespread dissemination of practical scientific and technological information to advance policy, practice, and services to improve outcomes for people with disabilities. NIDILRR programs address community living and participation, health and function, and employment. NIDILRR's investments in research, knowledge translation, and capacity-building activities are carried out through the following discretionary grant-funding mechanisms:
- **Rehabilitation Research and Training Centers (RRTC)** conduct advanced research and training on health, rehabilitation, employment, and community living topics.
- **Rehabilitation Engineering Research Centers (RERC)** conduct engineering research and development on technical solutions to rehabilitation problems or environmental barriers.
- **Disability and Rehabilitation Research Projects (DRRP)** conduct research, development, technical assistance, training, and utilization activities on health, rehabilitation, employment, and community living topics.
- **Americans with Disabilities Act (ADA) National Network** projects conduct research and provide information, training and technical assistance to ADA stakeholders.
- **Small Business Innovation Research (SBIR)** projects support small businesses to explore feasibility, develop, or evaluate the commercialization potential of new technology products.
- **Knowledge Translation** projects promote the use of research-based knowledge in practice.
- **Field-Initiated Projects (FIP)** conduct three-year studies on topics proposed by applicants to address disability and rehabilitation issues in promising and innovative ways.
- **Model Systems** programs in spinal cord injury, traumatic brain injury, and burn injury conduct research on rehabilitation recovery and long-term outcomes of these conditions. Research in these programs includes collaborative, multisite research, and longitudinal data.
- **Advanced Rehabilitation Research Training Projects (ARRT)** support institutions of higher education to provide advanced interdisciplinary research training to postdoctoral Fellows.
- **Research Fellowship Program (RFP), or Mary E. Switzer Fellowships**, are awarded to qualified individuals to conduct one-year independent research projects.
- **Section 21** focuses on research capacity building for minority-serving institutions, such as Historically Black Colleges and Universities and other institutions with significant racial and ethnic minority student populations. Section 21 of the Rehabilitation Act requires that 1% of NIDILRR appropriations be set-aside to address traditionally underserved populations.

Grant Mechanisms

Grant Competition and Peer Review Process

NIDILRR supports quality disability research in the domains of community living and participation, health and function, and employment. Funding is provided to the disability, independent living, and rehabilitation research communities through its funding mechanisms, with priorities within these mechanisms determined by the agency. Since the publication of NIDILRR's Long Range Plan for 2013-2017, there has been increased emphasis on field-initiated priorities that allow researchers to propose innovative research and development projects to promote improved outcomes among people with disabilities in the broad outcome domains of community living and participation, employment, and health and function. The agency ensures a rigorous research portfolio by administering a systematic peer review process and internal and external program evaluation. NIDILRR also chairs the Interagency

Committee on Disability Research (ICDR), whose mission is to promote coordination among federal agencies responsible for disability.

NIDILRR's systematic peer review process assures that only the highest-quality research is funded, as required by federal regulation. During the peer review process, subject matter experts with the appropriate credentials and content knowledge are tasked with evaluating the scientific, technical, and management aspects of proposals submitted in response to NIDILRR funding opportunity announcements. This process generates an average score across reviewer panels, reducing bias and facilitating the ranking of projects by scientific merit. Only the highest-ranking proposals are recommended for funding by NIDILRR.

To enable greater innovation and flexibility, NIDILRR has expanded its use of field-initiated research in recent years. This approach allows the field to propose and implement a wide variety of projects in broad research and development areas defined by NIDILRR. NIDILRR's Field-Initiated Projects are its most competitive. NIDILRR's 2015 competitions for Disability and Rehabilitation Research Projects (DRRP) in the health and function and community living and participation domains each received more than thirty applications. Based on allocated funding, NIDILRR made two awards under each of these opportunities.

NIDILRR also introduces "seed money" into the private sector through its participation in the Small Business Innovation Research (SBIR) program. SBIR grantees are small businesses that compete for grants to support the research and development of marketable products that align with a sponsoring organization's programmatic goals. NIDILRR SBIR grantees produce products that promote the community living and participation, health and function, and employment function outcomes of individuals with disabilities. Phase I SBIR grants support the initial feasibility-testing and prototype-development phase. Based on allocated funding, NIDILRR funded 21% of the SBIR Phase I applications that it received. Phase II projects, which are selected from a pool of successfully funded Phase I grants, were also highly competitive at a funding rate of 36%.

Monitoring and Oversight

NIDILRR provides rigorous oversight of its funded initiatives through its Annual Performance Reporting (APR) Data System, formative review mechanisms, and close monitoring of grant activities by NIDILRR staff. NIDILRR's APR is a Web-based grants performance system used by grantees to provide data about goals and objectives, staffing, budget, research issues such as sample size and method, progress, outputs and accomplishments. This data is used to determine whether continuation funding should be provided to a grantee. For a new grantee, the first reporting period begins on the start date of the award and extends until May 31 of the following year. Subsequent reporting periods begin June 1 and end May 31. Grantees submit their progress reports annually on July 1.

Formative evaluations of funded awards are also conducted to provide oversight and technical assistance to grantees. Such reviews are conducted when NIDILRR program officers believe that a grantee could benefit from targeted technical assistance. A panel of subject matter experts is chosen to provide the technical assistance and make recommendations for improvement. Only one NIDILRR-

funded project received a formative evaluation in FY 2015. It complied with all programmatic recommendations resulting from it.

NIDILRR staff provides informed, directive, and collaborative oversight to NIDILRR's grantees. In addition, program officers maintain ongoing, routine interaction with grantees to help inform their scientific programs and ensure grantees are meeting goals and objectives. Program Officers use the HHS Grants Policy Administration Manual to provide consistent oversight across projects. Risk assessments are conducted with poor-performing grantees, with additional oversight and technical support provided as needed. This process aids the program officer in monitoring a grantee's performance with more scrutiny, preventing their continued funding when they fail to meet requirements.

Funding Overview

The allocation of NIDILRR grant funds for FYs 2014 and 2015 for the 11 funding mechanisms discussed in this section is shown in Table 1 (see page 9). For each funding mechanism, the table includes the number of new and continuation awards, along with the corresponding grant amount and the combined totals for FYs 2014 and 2015. NIDILRR's overall grant allocations across all 11 funding mechanisms totaled \$98,013,248 for FY 2014 and \$95,769,377 for FY 2015. NIDILRR awarded \$5,950,752 in contracts and other support activities for FY 2014 and \$8,200,623 in FY 2015.

Table 1. NIDILRR-Funded Centers and Projects: Funding and Awards, Fiscal Years 2014 and 2015

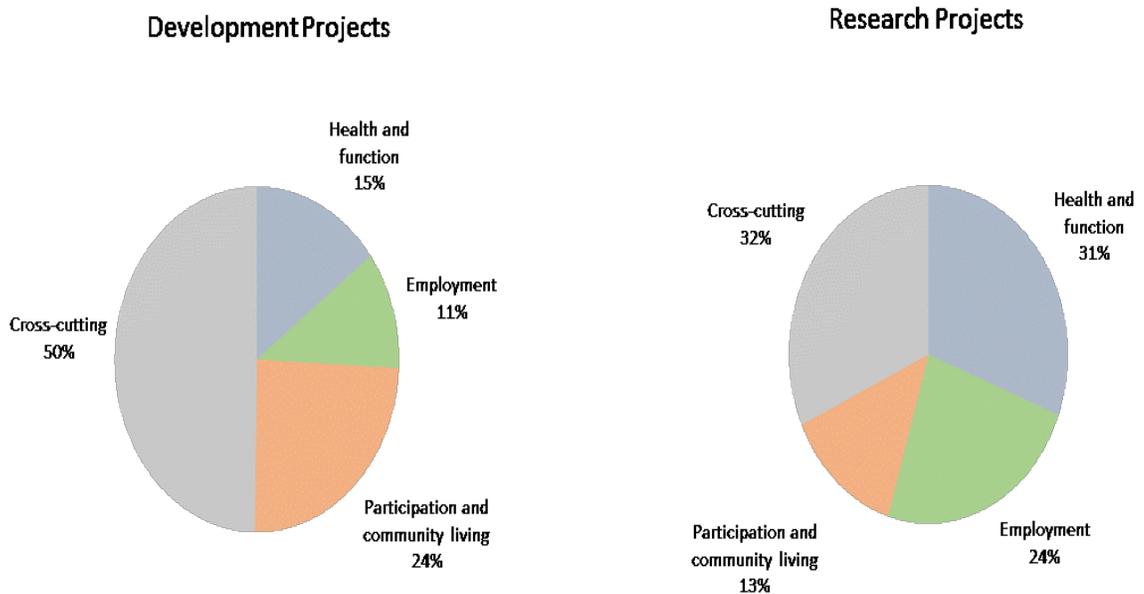
		Number of Awards	Grant Amount	Number of Awards	Grant Amount
		FY 2014	in thousands of dollars	FY 2015	in thousands of dollars
<i>NIDILRR-Funded Centers and Projects</i>					
Rehabilitation Research and Training Centers	Continuations	17	\$11,793	17	\$14,621
	New Awards	7	\$6,097	4	\$3,500
	Total	24	\$17,890	21	\$18,120
Rehabilitation Engineering Research Centers	Continuations	12	\$12,197	14	\$11,245
	New Awards	4	\$3,798	3	\$2,774
	Total	16	\$15,995	17	\$14,019
Disability and Rehabilitation Research Projects	Continuations	15	\$7,643	22	\$11,579
	New Awards	7	3,405	4	\$1,997
	Total	22	\$11,048	26	\$13,576
Americans with Disabilities Act National Network	Continuations	12	\$12,532	0	\$0
	New Awards	0	\$0	12	\$12,532
	Total	12	\$12,532	12	\$12,532
Small Business Innovation Research Projects	Continuations	2	537		
	New	15	\$2,188	20	\$3,553
	Total	17	2,725		
Knowledge Translation	Continuations	5	\$3,325	3	\$2,211
	New Awards	0	\$0	4	\$950
	Total	5	\$3,325	7	\$3,161
Field-Initiated Projects	Continuations	41	\$7,085	36	\$6,976
	New Awards	20	\$4,591	13	\$2,594
	Total	61	\$11,676	49	\$9,570
Model Systems					
<i>Spinal Cord Injury</i>	Continuations	16	\$8,018	14	\$6,492
	New Awards	0	\$0	0	\$0
	Total	16	\$8,018	14	\$6,492
<i>Traumatic Brain Injury</i>	Continuations	18	\$8,224	18	\$8,223
	New Awards	0	\$0	0	\$0
	Total	18	\$8,224	18	\$8,223
<i>Burn Injury</i>	Continuations	5	\$1,850	5	\$1,850
	New Awards	0	\$0	0	\$0
	Total	5	\$1,850	5	\$1,850
Advanced Rehabilitation Research Training Projects	Continuations	15	\$2,500	14	\$2,100
	New Awards	3	\$450	4	\$527
	Total	18	\$2,950	18	\$2,627
Mary E. Switzer Fellowships	New Awards	5	\$365	6	\$420
Section 21		4	\$1,415	5	\$1,625
TOTAL		223	\$98,013	218	\$95,769

Source: U.S. Department of Health and Human Services, Administration for Community Living, NIDILRR. 2015 Annual Performance Reports.

Exhibit 1 (see below) illustrates the distribution of funded research and development grant projects in FY 2015 across NIDILRR’s three domains: health and function, community living and participation, and employment. “Cross-cutting” is a category used in the Annual Performance Report to describe projects that reflect two or more domains. Half (50%) of development projects and about one-third (32%) of research projects were described as cross-cutting. “Research projects” are defined by NIDILRR as “an intensive systematic study, based on a clear hypothesis or research question that is directed toward producing new scientific knowledge about the subject or problem being studied.” “Development Projects” are defined as “the use of knowledge and understanding gained from research to create materials, devices, systems, or methods beneficial to the target population, including design and development of prototypes and processes.”

NIDILRR GRANTEES ARE HEAVILY ENGAGED IN RESEARCH ON COMMUNITY LIVING AND PARTICIPATION.

Exhibit 1. Research and Development Grant Projects by Domain, FY 2015



Source: U.S. Department of Health and Human Services, Administration for Community Living, NIDILRR. 2015 Annual Performance Reports.

Grantee Activities and Progress

NIDILRR collects output data through the APR. Grantees are required to report each output from their funded activities in one of four categories: Publications; Tools, Measures, and Intervention Protocols; Technology Products and Devices; and Informational Products.

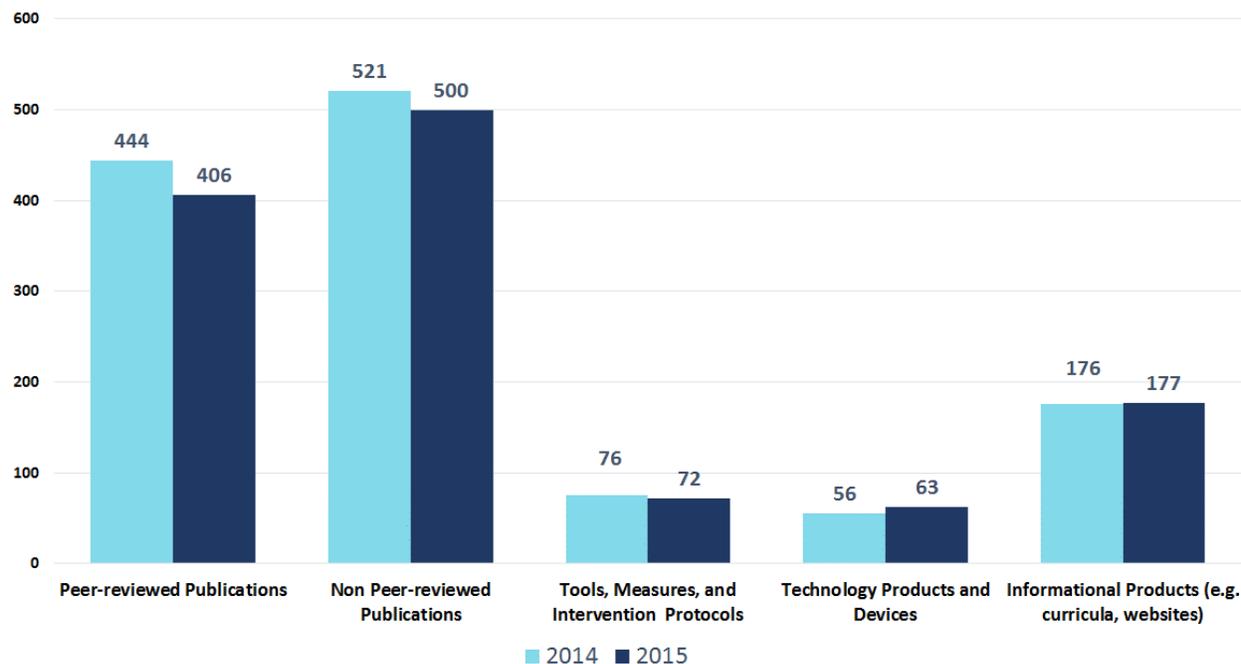
A brief description of each category of output type follows:

- **Publications** are documents directly funded by a grantee's current NIDILRR award. Publications include journal articles, periodicals, web journals, proceedings from meetings and symposia, books or book chapters, monographs, abstracts, technical or research reports, and reviews. Within this output category are peer-reviewed and non-peer reviewed publications. Peer-review is an evaluation process of the accuracy of a manuscript and the validity of the research methodology and procedures by a panel of reviewers from the same scientific or academic discipline. This process is conducted prior to publication and the review panel can recommend revisions to the work, or reject it's submission for publication. Non-peer reviewed publications do not receive this level of critique. Documents that are currently in review, accepted for publication, in press, or self-published are not reported in the APR.
- **Tools, measures and intervention protocols** include instruments or processes created to acquire quantitative or qualitative information, knowledge or data on a specific disability or rehabilitation issue. Examples include checklists; survey questionnaires or interview schedules; interventions; statistical or methodological techniques; databases; and diagnosis or assessment instruments, including physiologic measures and outcome measures.
- **Technology products and devices** are developed, modified, tested, or evaluated by the grantee. This refers to any technology product or device under the award that the grantee disseminated or delivered to external audiences during the current reporting period. These include the development of industry standards/guidelines; software or netware; invention, patents, licenses and patent disclosures; working prototypes; product(s) evaluated or field-tested; product(s) transferred to industry for potential commercialization; and product(s) in the marketplace.
- **Information products** refer to items such as training manuals/curricula, fact sheets, newsletters, audiovisual materials, marketing tools, educational aids, Websites, presentations, and other forms of disseminated information.

Exhibit 2 (see page 12), compares the number of output products produced by grantees within each category type in FYs 2014 and 2015. Additional detail has been provided for the category of publications, with peer-reviewed and non-peer-reviewed publications being reported separately.

There was little change in the number of products within category types between FYs 2014 and 2015. The most common types of outputs were publications, with the number of non-peer reviewed publications exceeding the number that were peer-reviewed.

Exhibit 2. Total Outputs Produced by all Grantees Across all Program Mechanisms, by Product Type, 2014–2015



Source: U.S. Department of Health and Human Services, Administration for Community Living, NIDILRR. 2015 Annual Performance Reports.

NIDILRR Programs and Selected Accomplishments

Data obtained through the 2015 APR shows that NIDILRR supported 218 grantees during FY 2015, totaling \$95,769,377 across all program mechanisms. An additional 40 grantees were active without funding, in no-cost extension status. These grantees reported 1,499 research, development, or training projects in process. These projects reflect the breadth of disability and rehabilitation research within the agency’s outcome domains of community living and participation, health and function, and employment.

NIDILRR SUPPORTED 218 GRANTEES DURING FY 2015, TOTALING \$95,769,377 ACROSS ALL PROGRAM MECHANISMS.

The knowledge and products that are generated by NIDILRR-sponsored research and development grants have a wide variety of important impacts in the field. The summaries that follow, organized by funding mechanism, provide examples of the outcomes and impacts that resulted from NIDILRR’s investments. Additional information concerning these projects is available through the National Rehabilitation Information Center (NARIC) website (<http://www.naric.com/>).

Rehabilitation Research and Training Centers (RRTCs)

RRTCs conduct coordinated, integrated and advanced programs of research, training, and information dissemination in topical areas that are specified by NIDILRR. RRTCs conduct research to improve

rehabilitation methodology and service delivery systems; improve health and functioning; and promote employment, independent living, family support, and economic and social self-sufficiency for individuals with disabilities. They provide training, including graduate, pre-service, and in-service training to assist rehabilitation personnel to more effectively provide rehabilitation services to individuals with disabilities. They also serve as centers of national excellence in rehabilitation research for providers and for individuals with disabilities and their representatives. Awards are normally made for a five-year period.

The following are examples of RRTC accomplishments reported to NIDILRR in FY 2015:

- **Diabetes Education Tool Kit Helps People with Mental Health Disorders Manage Both Conditions.**
University of Illinois, Chicago: RRTC on Psychiatric Disability and Co-occurring Medical Conditions (Grant # 90RT5012). The RRTC on Psychiatric Disability and Co-occurring Medical Conditions developed an online tool kit designed to help people with psychiatric disabilities who are at increased risk for diabetes and prediabetes understand and manage their diabetes or pre-diabetic condition. The tool kit includes an extensive library of materials and podcasts covering the basics of diabetes, building and maintaining a healthy lifestyle, and managing hypertension and the risks of diabetes. Also included is a chart of American Diabetes Association standards of care with related educational material. Materials from the tool kit have been downloaded more than 48,000 times. The Canadian Mental Health Association included the tool kit in their Diabetes and Mental Health Peer Support Project. The tool kit can be found at www.cmhsrp.uic.edu/health/diabetes-library-home.asp.

- **Tip Sheets Aid Youth and Young Adults with Serious Mental Health Conditions in Employment Challenges.**
University of Massachusetts Medical School: RRTC on Learning and Working during the Transition to Adulthood (Grant #s 90RT5031). The RRTC on Learning and Working during the Transition to Adulthood produced a series of employment-related tip sheets that were developed and reviewed with input from young adults with serious mental health conditions. The descriptive tip sheet titles illustrate the range of topics addressed:
 - How to Keep a Job: The Young Adults Guide
 - Applying for a Job: The Young Adults Guide
 - Do I Tell My Boss? Disclosing My Mental Health Condition at Work
 - Vocational Rehabilitation: A Young Adults Guide
 - Tools for School: Accommodations for College Students with Mental Health Challenges
 - Telling Your Money What to Do: The Young Adult's Guide

These sheets serve as important resources for young adults with serious mental health conditions, providing solid advice for coping with employment challenges, which can improve their chances of success in the workforce. The tip sheets can be found at <http://umassmed.edu/TransitionsRTC/publication/>.

- **Researchers Examine the Effects of the Environment on Community Participation Among People with Disabilities.**
Rehabilitation Institute of Chicago: RRTC on Improving Measurement and Medical Rehabilitation Outcomes (Grant # 90RT5008). Researchers from the RRTC on Improving Measurement and Medical Rehabilitation Outcomes focused on reexamining assumptions surrounding the role of environmental factors on the health and participation of people with disabilities. The research team reviewed theories from the fields of social, community, and developmental psychology, including a consideration of disability studies, gerontology, public health, and rehabilitation in an effort to examine the role of environmental factors and their measurement. They also discussed the application of these theories along with different technologies that could play a key role in helping to quantify, document, and communicate the dynamic interrelationships between environmental factors, participation, and health outcomes for people with disabilities. This is a critical step for understanding the environment-participation relationship and providing rehabilitation stakeholders with information needed to modify environments to facilitate the social inclusion of individuals with disabilities. The authors' findings were published in the following paper: Magasi, S., Wong, A., Gray, D. B., Hammel, J., Baum, C., Wang, C. C., & Heinemann, A. W. (2015). Theoretical foundations for the measurement of environmental factors and their impact on participation among people with disabilities. *Archives of Physical Medicine and Rehabilitation, 96*(4), 569–577.
- **Prominent Researcher on Intellectual and Developmental Disabilities Describes Strategies for Overcoming Service Barriers in Presidential Speech to the American Association for Intellectual and Developmental Disabilities.**
Research and Training Center on Community Living (Grant # 90RT5019). Dr. Amy Hewitt, from the University of Minnesota's Research and Training Center on Community Living, served as president of the prestigious American Association for Intellectual and Developmental Disabilities. In her Presidential Address to the organization, she described the complexities and barriers of our existing intellectual and developmental disabilities (IDD) system. She described the way that this system hinders community living outcomes and proposed a new direction and strategies to overcome these barriers. Dr. Hewitt also argued that the issues of community inclusion, participation, and citizenship remain particularly significant within the IDD system and that all three of these areas need to be adequately addressed to support people with IDD and help promote improved outcomes. Her discussion highlighted many specific complexities and challenges that people with IDD face, including the complex maze of available services, differences in language and jargon, geographic differences, and the importance of education and learning. Her speech is published as: Hewitt, A. (2014). Presidential Address, 2014—Embracing complexity: Community inclusion, participation, and citizenship. *Intellectual and Developmental Disabilities, 52*(6), 475–495.
- **Researchers on Disability in Rural Communities Tackle Employment, Wellness and Hospital Practices.**
University of Montana: RRTC on Disability in Rural Communities (Grant # 90RT5025). The RRTC on Disability in Rural Communities at the University of Montana developed new procedures for

using electronic communications and social media to provide vocational rehabilitation services and supports. They also advanced their mission to promote participation in the community and the workforce through improved vocational rehabilitation resources, dissemination of evidence-based wellness programs, and other research by creating a Web-based health education program tailored for vocational rehabilitation consumers: Health Plans to Employment. They also completed a study on the factors affecting community participation in persons with chronic pain. With federal partners at ACL, the RRTC identified geographic regions that exhibited service overlap of independent living centers and aging and disability resource centers, as well as those that experienced a deficit of services. The RRTC has applied participatory action research to develop an agenda to enhance hospital discharge and transition procedures. This compilation of projects emphasizes how the RRTC is altering rural health practices and providing resources to foster community participation and independent living.

Rehabilitation Engineering Research Centers (RERCs)

RERCs focus on issues dealing with rehabilitation technology and engineering. The purpose of the RERC program is to improve the effectiveness of services authorized under the Rehabilitation Act by conducting advanced engineering research and development of innovative technologies designed to solve particular rehabilitation problems or remove environmental barriers. RERCs also demonstrate and evaluate such technologies, facilitate service delivery systems changes, stimulate the production and distribution of equipment in the private sector, and provide training opportunities to enable individuals, including individuals with disabilities, to become researchers and practitioners of rehabilitation technology. Awards are normally made for a five-year period.

Examples of RERC accomplishments reported to NIDILRR in FY 2015 follow:

- **“Tiramisu” App Assists Individuals with Disabilities and Others to Effectively Access Public Transportation.**
Carnegie Mellon University: RERC on Accessible Public Transportation (Grant # 90RE5011).
Researchers at the RERC on Accessible Public Transportation continue to refine a Smartphone application system called Tiramisu (“pick me up” in Italian) that enables urban bus transit riders to provide real-time information about the bus on which they are riding. This includes delays, seating availability, and accessibility problems. Riders use their free Tiramisu Smartphone app to send this information to the Tiramisu system, which in turn makes this information available to potential riders via the Internet. This allows riders to engage in a collaborative relationship with transit providers to identify and resolve accessibility barriers they encounter and to increase transit agency awareness of issues with service quality. An early iteration of Tiramisu placed second in the Intelligent Transportation Society of America Best New Innovative Products, Services or Applications category in 2011. A brief description of the app is available at www.hcii.cmu.edu/news/stories/tiramisu-app-wins-fcc-chairmans-award.

- **Inventors and Small Business Partner to Develop Walker that Helps Individuals Come to Standing Position.**
Georgia Institute of Technology: RERC for Wheeled Mobility in Everyday Life (Grant # 90RE5000). The RERC for Wheeled Mobility in Everyday Life, via a design competition involving inventors and small businesses, designed and developed the Stand-Up Walker as part of the inventor-driven design project of the RERC. The device helps individuals with mobility issues rise from a seated position. Inventors presented their ideas to RERC staff consisting of engineers, scientists, and clinicians, and were provided with feedback addressing technical, clinical, and policy issues related to the design. The winning inventor, Mr. Howard Liles, fabricated the prototype Walker while the RERC organized meetings with physical therapists to get feedback on the device. This led to the identification of design revisions that were later incorporated into several prototype iterations. Urise Products was the start-up that licensed the Walker, completed the production design and launched the product. Additional information can be found at www.standupwalker.com/ourstory/ and www.uriseproducts.com/.
- **New Book Offers Multidisciplinary Perspective on Transitional Care in Osteogenesis Imperfecta.**
Marquette University: RERC on Technologies for Children with Orthopedic Disabilities (Grant # 90RE5006). Fellows from the RERC on Technologies for Children with Orthopedic Disabilities, ARRT in Pediatric Mobility for Physicians and Engineers, ARRT in Pediatric to Adult Transition, and Marquette University contributed to the development of a book entitled *Transitional Care in Osteogenesis Imperfecta: Advances in Biology, Technology and Clinical Practice*. The work is particularly powerful because it brings together perspectives and research from multiple professional groups and disciplines, including surgeons, clinicians, scientists, and engineers. Additionally, the work integrates technology, orthopedic, and genetic chapters with an eye toward a transitional care continuum. As the authors note, osteogenesis imperfecta is a difficult genetic condition that changes over time, resulting in the need for transitional care that addresses the many challenges that people with the condition face. By combining such a range of perspectives and backgrounds, the book offers a unique insight into the condition and ways of improving care and solving problems in the pediatric-to-adult environment. The book is available online at www.tech4pod.org/.
- **Telecommunications Industry of America Technology and Standards Secretariat Publishes New Standard for Magnetic Performance between Handsets and Hearing Devices.**
Board of Regents at the University of Wisconsin: RERC on Telecommunications Access (Grant # 90RE5003). The Secretariat for the Telecommunications Industry of America Technology and Standards published the standard TIA-1803-B, specifying the testing standards for the magnetic performance between handsets and headsets. This revision widened the scope of previous iterations to include testing standards for wideband audio. The RERC on Telecommunications Access at the University of Wisconsin played a key role in establishing this standard. In fact, the decision to include support for wideband magnetic performance and use real speech in test signals was based on a study conducted by the RERC. Wideband audio significantly increases the quality of speech understood by people with hearing loss, reduces mental effort and improves the effectiveness of handsets and hearing devices. Recent hearing devices now support the

frequencies used in wideband audio and this standard helps to formalize the testing procedures used for these devices. Telecommunications Industry of America standard documents can be purchased by visiting <http://global.ihs.com/?rid=TIA>.

Disability and Rehabilitation Research Projects (DRRPs)

The DRRP funding program supports projects that carry out one or more of the following activities: research, development, demonstration, training, dissemination, utilization, and technical assistance. The purpose of the DRRP program is to plan and conduct research, demonstration projects, training, and related activities to develop methods, procedures, and rehabilitation technology that maximize the full inclusion and integration of individuals with disabilities into society, employment, independent living, family support, and to promote economic and social self-sufficiency and improve the effectiveness of services authorized under the Rehabilitation Act.

NIDILRR funds several types of DRRPs, including: (1) Knowledge Translation projects; (2) Model Systems in traumatic brain injury (TBI) and burn injury; (3) ADA National Network projects; (4) Section 21 Program; and (5) individual research projects. SCI Model System is not included with the other model systems as a DRRP because it has its own statutory authority. The first four types of DRRPs are managed as separate programs and, therefore, only individual research DRRPs are described here under the general DRRP heading. DRRPs differ from RRTCs and RERCs in that they generally do not provide training and technical assistance. Awards range from three to five years.

The following is one example of a DRRP accomplishment reported to NIDILRR in FY 2015:

- **Valuable New Model Estimates Return on Investment for State Vocational Rehabilitation Agencies.**

University of Richmond (Grant # 90DP0070). The University of Richmond developed a Return on Investment (ROI) model by examining the employment outcomes of individuals with disabilities who applied for services from the Virginia Department of Aging and Rehabilitation Services (VA-DARS). Labor market impacts were estimated at the individual level, allowing identification of impacts by disability type, services, and the agency. This work generated research findings that were shared with VA-DARS to inform policies and practice for consumers with disabilities. Findings were also disseminated through peer-reviewed journals to help inform the field regarding the potential of ROI for strategic planning, program evaluation, and improved service delivery. In 2015, the University of Richmond successfully competed for additional NIDILRR funding for expanding and refining ROI models for additional agencies in Delaware,

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Maryland, Texas, and Oklahoma. This work continues to provide important information for rehabilitation professionals, policymakers, and consumers interested in improving the employment outcomes of individuals with disabilities. To read more about the model(s), view the following publications:

- Dean, D., Pepper, J. V., Schmidt, R. M., & Stern, S. (2015). The effects of vocational rehabilitation for people with cognitive impairments. *International Economic Review*, 56(2), 399–426.
- Dean, D., Pepper, J. V., Schmidt, R. M., & Stern, S. (2014). State vocational rehabilitation programs and federal disability insurance: An analysis of Virginia’s vocational rehabilitation program, *IZA Journal of Labor Policy*, 3(7), 1–19.

ADA National Network

The ADA National Network consists of 10 regional centers that provide information, training, and technical assistance to individuals, businesses, and agencies with rights and responsibilities under the ADA. The network also includes research and knowledge translation components, which are carried out by two network grantees, the ADA National Network Collaborative Research Project, and the ADA National Network Knowledge Translation Center, respectively.

Research funded under the first grantee is known as the ADA Participatory Action Research Consortium (ADA-PARC). This research examines individual and environmental factors influencing the community living of citizens with disabilities. Research activities include mining existing datasets to inform the benchmarking of key participation disparities and promising practices at state, regional and community levels. Additional efforts include collecting data on individuals transitioning from nursing homes and institutions to the community to assess their experiences and concerns. Findings from this research inform strategies for creating livable communities for individuals with disabilities through inclusive and accessible private and public spaces.

The ADA Knowledge Translation Center enhances the impact of the Network’s activities, increases awareness and use of research findings, conducts knowledge translation research, and improves understanding of ADA stakeholders’ needs for and receipt of Network services. The Center is conducting a five-year project to review and translate research findings and identify knowledge gaps. The last year of the project includes a State of the Science conference on ADA implementation research. While the ADA-PARC and the ADA Knowledge Translation Center uniquely contribute to the Network’s generation of knowledge of national significance related to ADA, each regional center focuses on the distinct needs of its individual regions. The regional focus is critical to ensuring that Network services meet the needs of diverse populations and stakeholders throughout the country.

ADA National Network grantees responded to 59,302 technical assistance requests in FY 2015. The Network delivers over half of its technical assistance by phone (52%), with another 30 percent delivered through email communications. In-person assistance is less prevalent (17%) than phone or email support. The ADA National Network

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most commonly delivers training activities to grantees through formal courses (19%), Webcasts (18%), presentations (18%), and workshops (18%).

In addition to training and technical assistance, the ADA National Network and its regional centers produce numerous, highly popular products to aid in disseminating information to the public, employers, and individual with disabilities about their rights and responsibilities. During FY 2015, the network reported 1,004,746 downloads of its electronic materials, such as journal articles, audio tapes, DVDs/CDs, newsletters, fact sheets, conference proceedings, and more.

Other types of products the Network developed were disseminated 278,000 times. They also disseminated materials developed by others, such as publications, bulletins, and audio tapes, which were accessed electronically 75,377 times and over 25,000 times through other means. Bulletins, newsletters, and fact sheets were the most commonly disseminated types of products across all categories. Products in the "Other" category were the second most commonly disseminated products. Examples of products in the "Other" category included, but were not limited to, federal guidance documents, legal briefs, custom technical assistance items, and federal and public announcements.

The following are examples of ADA Network accomplishments reported to NIDILRR for FY 2015:

- **Southeast ADA Center Develops ADA Anniversary Tool Kit in Celebration of the 25th Anniversary of the ADA.**
Syracuse University (Grant # 90DP0019). The Southeast ADA Center at Syracuse University developed an ADA Anniversary Tool Kit, a Website dedicated to publications, resources, training, events, and news on the ADA for use in planning events to celebrate the 25th anniversary of the ADA. The ADA Legacy Project adopted the ADA Anniversary Tool Kit to promote "ADA25." The ADA Legacy Project is committed to honoring the contributions of people with disabilities by preserving the history of the disability rights movement, celebrating its milestones, and educating the public and future generations of advocates. As a result of adoption of the ADA Anniversary Tool Kit by the ADA Legacy Project, awareness of the ADA and the ADA National Network knowledge resources increased. The ADA Anniversary Tool Kit Website also promotes the ADA25 Pledge, which encourages individuals to recommit to the principles of the ADA. The ADA National Network Website experienced a 378 percent increase in page views and a 228 percent increase in users since 2014. To date, the Website has collected over 9,000 signatures from individuals, organizations, government entities, and faith communities who pledge to celebrate and recommit to the ADA. The ADA Anniversary Tool Kit is located at www.adaanniversary.org.
- **The Northwest ADA Center's ADA Accessibility Checklist Helps Washington State Department of Corrections Improve Physical and Programmatic Access.**
University of Washington (Grant # H133A110015). The Northwest ADA Center at the University of Washington updated their ADA Accessibility Checklist to reflect the 2010 ADA Standards for Accessible Design, published in March 2015. Washington State Department of Corrections used this checklist in assessing all 13 of its correctional facilities for ADA accessibility. This tool was also instrumental in assisting Washington State Department of Corrections in formulating a

Transition Plan to improve physical and programmatic access. The checklist can be accessed at [http://nwadacenter.org/sites/adanw/files/files/2010%20ADA%20Standards%20Checklist_Marc%202015%20Edition\(1\).docx](http://nwadacenter.org/sites/adanw/files/files/2010%20ADA%20Standards%20Checklist_Marc%202015%20Edition(1).docx).

- **ADA National Network Trains Employers to Support Employees with Disabilities.** **The ADA National Network (Grant # 90DP0015-02-00).** The ADA National Network provides information, training, and technical assistance on the ADA to businesses, agencies, and the public. Members also conduct research. In 2014, the Network served more than 235,000 employers, state and local governments, and people with disabilities. The Network promoted workplace implementation of the ADA through direct interaction with employers and individual job hunters, as well as through the creation and delivery of training. For example, several centers launched the Just-in-Time Tool Kit for Managers, an online training for supporting employees with a disability. For more information, visit www.disabilitytoolkit.org/.

Small Business Innovation Research (SBIR)

The intent of NIDILRR's SBIR program is to help support the development of new ideas and projects that are useful to persons with disabilities by inviting the participation of small business firms with strong research capabilities in science, engineering, or educational technology. Small businesses must meet certain eligibility criteria to participate: the company must be American-owned and independently operated, it must be for-profit, employ no more than 500 employees, and the principal researcher must be employed by the business. During Phase I, NIDILRR funds firms to conduct feasibility studies to evaluate the scientific and technical merit of an idea. During Phase II, NIDILRR-funded firms expand on the results of Phase I to pursue further development.

The following are examples of SBIR accomplishments reported to NIDILRR during FY 2015:

- **Inventors Enhance Communication Options by Converting Digital Data into Audiovisual Form.** **Charmtech Labs, LLC (Grant #s 90BI0005 & 90BI0004).** Charmtech Labs, LLC developed the Capti Narrator, a universally accessible technology that helps people listen to digital content in an audiovisual form. The content can be imported to the Capti Playlist in a variety of formats and from multiple sources (e.g., Web, One Drive, and Dropbox) and can be narrated by high-quality synthetic voices speaking in different languages and accents. Capti Narrator can be used as an application in most Web browsers, installed on PCs (and soon Macs), and installed as an app on mobile devices. It has been downloaded hundreds of thousands of times. Capti Narrator was developed as assistive technology for people with vision impairments and proved to be useful for people with illiteracy, as well as disabilities such as dyslexia. The technology is being adopted by public schools and universities, and this collaboration has helped to further develop additional functionalities needed in educational settings. Charmtech Labs is now exploring how English language learners could acquire the language faster with Capti. The Capti Narrator received an FCC Chairman's Award for Advancing Accessibility and the Delegates' Award in the W4A Accessibility Challenge. Its Principal Investigator, Dr. Yevgen Borodin, was recognized as a MIT Technology Review Innovator under 35 for his work on Capti Narrator and other accessibility research. Capti Narrator can be accessed via www.captivoice.com.

- **Accommodation-Integrated Technology that Minimizes the Impact of Disability on Students' Assessment Performance.**
3-C Institute for Social Development, Inc. (Grant # 90BI0007). 3-C Institute for Social Development, Inc. developed Assess2Progress, a Web-based program to assist teachers in creating disability-accessible assessments of any type in any subject area for students in kindergarten through fifth grade. The program uses universal design principles to deploy assessments with embedded text-to-speech functions, audio controls, and visual accommodations. The next phase of this project will develop a fully functioning software system with tailored teacher and student user interfaces through pre-pilot usability testing and field-testing with kindergarten through fifth-grade students and teachers. The Assess2Progress program eliminates barriers toward fair and adequate testing by giving teachers the tools they need to make appropriate accommodations and offer accessible testing options for students with disabilities.

Knowledge Translation

In the disability context, knowledge translation is a process of ensuring that new knowledge and products gained through the course of research and development can ultimately be used to improve the lives of individuals with disabilities and further their participation in society. Knowledge translation is built upon and sustained by ongoing interactions, partnerships, and collaborations among various stakeholders in the production and use of such knowledge and products, including researchers, practitioners, policymakers, individuals with disabilities, and others. NIDILRR has invested in knowledge translation by directly funding research and development projects in its Knowledge Translation portfolio and by integrating the underlying knowledge translation principles of interactions, partnerships, and collaborations among stakeholders into the content of all priorities. The projected long-term outcomes are knowledge and products that can be used to solve real issues faced by individuals with disabilities.

The following is an example of a Knowledge Translation accomplishment reported to NIDILRR in FY 2015:

- **Systemic Review of Nonmedical Interventions Examines the Employment of Cancer Survivors.**
Southeast Educational Development Laboratory, a subsidiary of the American Institutes for Research (Grant # 90DP0022). The Center on Knowledge Translation for Employment Research conducted a meta-analysis of experimental and quasi-experimental studies focusing on behavioral, psychological, educational, or vocational interventions with cancer survivors aged 18 or older, and the impact on employment of these interventions. A meta-analysis is a systematic statistical examination across a series of studies used to combine findings and identify a single conclusion that has increased statistical power than the individual studies themselves possess. The meta-analysis did not provide strong, statistically supported evidence of the impact of the reviewed interventions. In response to these findings, the researchers called for additional studies, with greater methodological rigor, to be conducted. A summary of this meta-analysis can be found at <http://campbellcollaboration.org/lib/project/225/>.

Field-Initiated Projects (FIPs)

The Field-Initiated Projects (FIPs) are a program of investigator-initiated research intended to supplement NIDILRR's agency-directed research portfolio. These projects cross all of NIDILRR's domains, and generate new knowledge through research or development on a smaller scale relative to DRRPs and Center grants. Typical FIP awards are three years in duration.

The following are examples of FIP accomplishments reported to NIDILRR in FY 2015:

- **Problem-Solving Strategies Help Individuals with Intellectual and Developmental Disabilities (IDD) Set Actionable Career Goals.**
University of Missouri (Grant # 90IF0028). This project evaluated the efficacy of the Self-Determined Career Development Model (SDCDM) in improving employment outcomes for adults with intellectual and developmental disabilities. The SDCDM is a self-directed process using a three-phase, problem-solving strategy. A facilitator supports a person with a disability to identify and set career goals, develop an action plan, self-monitor and self-evaluate progress toward the goal, and revise the plan as needed. The project provides training, technical assistance, and coaching on the model. There were 81 employment support providers trained to facilitate career discovery using the SDCDM. In response to a Department of Justice Settlement which ruled that the State of Rhode Island was in violation of the ADA Olmstead requirements by unnecessarily segregating people with intellectual and developmental disabilities, the state is implementing the SDCDM to train all middle and high school teachers to promote self-determination. The training manual and facilitator's resource guide are published, and freely available online at <http://ngsd.org/professionals/self-determined-career-development-model>
- **Research Highlights Impediments to Implementation of Medicaid Home and Community-Based Services for Children with Autism.**
Towson University (Grant # H133G12003). Investigators at Towson University studied state policy factors that contribute to, or impede, the implementation of home and community-based service autism waivers, as well as the service needs of children with autism, and their families. They found that waiver status was associated with improvement in family quality of life and increased perceived child improvement in independent living skills. More intensive individual support services and frequent therapeutic integration predicted improved academic performance and independent living skills. Two peer-reviewed publications were developed from this study:
 - Eskow, K. G., Chasson, G. S., & Summers, J. A. (2015). A cross-sectional cohort study of a large, statewide Medicaid home and community-based services autism waiver program. *Journal of Autism and Developmental Disorders*, 45(3), 626–635.
 - Merryman, M. B., Miller, N. A., Shockley, E., Eskow, K. G., & Chasson, G. S. (2015). State adoption of Medicaid 1915(c) waivers for children and youth with Autism Spectrum Disorder. *Disability and Health Journal*, 8(3), 443–451.
- **Online Braille Math Tutorial Opens Learning Opportunities in the Science, Technology, Engineering and Math (STEM) Fields for Individuals with Visual Impairment.**
Research and Development Institute at Northern Illinois University (Grant # H133G110122).

Fluency in reading and writing mathematical symbols is essential for the study of advanced mathematics. A special version of braille, the Nemeth Code, exists in which all of the symbols comprising mathematics are depicted in braille. Unfortunately, many individuals who are responsible for teaching blind students are not sufficiently competent to provide advanced training in the reading and writing of braille math. To solve this vexing problem, the staffs of the Research and Development Institute at Northern Illinois University collaborated with the American Printing House for the Blind in the development of an online braille math tutorial. The tutorial improves the ability of persons who are blind or visually impaired to read and write the symbols comprising the Nemeth Code, widening their opportunities to fully participate in STEM fields. The tutorial can be found at <https://tech.aph.org/nemeth/>.

Model Systems

NIDILRR's Model Systems programs in spinal cord injury (SCIMS), traumatic brain injury (TBIMS), and burn injury (BMS) provide coordinated systems of rehabilitation care and conduct research on recovery and long-term outcomes. In addition, these centers serve as platforms for collaborative, multisite research, including research on interventions using randomized controlled approaches. These programs also track Model Systems patients over time in large databases. The National SCI Database has been in existence since 1973 and captures data from an estimated 13% of SCI cases in the U.S. Since its inception, 28 federally funded SCIMS have contributed data to the National SCI Database. As of October 2015, the SCIMS center has over 44,280 individuals in its National

AS OF OCTOBER 2015, THE SCIMS HAS OVER 44,280 INDIVIDUALS IN ITS NATIONAL DATABASE. TBIMS AND BMS HAVE 14,406 AND 5,762 PERSONS, RESPECTIVELY, ENROLLED IN THEIR NATIONAL DATABASES.

Database. TBIMS and BMS centers have 14,406 and 5,762 persons, respectively, enrolled in their National Databases. The TBIMS National Database includes a large-scale ongoing follow-up of individuals post-injury. The BMS National Database is a prospective, longitudinal, multicenter research study that examines functional and psychosocial outcomes following burns for over 3,000 adults and almost 2,000 children. Studies using these databases have provided an abundance of groundbreaking information over the decades on the social and environmental factors influencing the community living and participation of individuals affected by these injuries, best clinical practices for screening and treatment, physiological aspects of the conditions, and long-term outcomes.

The following are examples of Model Systems accomplishments reported to NIDILRR in FY 2015:

- **Study Points to Rehabilitation Interventions That Are Associated with Positive Outcomes for People with Traumatic Brain Injury.** **Ohio State University (Grant # H133A080023).** Ohio State University coordinated a journal supplement that reported the results of the first practice-based evidence study of TBI rehabilitation. The study enrolled 2,205 individuals with TBI who were receiving initial inpatient rehabilitation across 10 rehabilitation centers. The study has resulted in the richest dataset on TBI rehabilitation ever assembled. The journal supplement included 12 articles, beginning with

an introductory article. The studies collectively identified the characteristics associated with patient outcomes, how clinical events mediated outcomes, and treatments used in response to various clinical problems. They further determined the best treatment options, as measured by superior outcomes, accounting for TBI severity and other factors. The analyses reported in the journal supplement are the beginning of an extensive analysis and reporting process. The findings will provide guidance in developing guidelines for clinical decision-making and other evidence-based practices. The reference for the journal supplement is: Horn, S. (Ed.). (2015). What works in inpatient traumatic brain injury rehabilitation? Results from the TBI-PBE study [Supplement]. *Archives of Physical Medicine and Rehabilitation*, 96(8), S173–S340.

- **Instrument Proves Valuable for Assessing Function and Functional Change in Individuals with SCI.**

Boston University (Grant # 90SI5013). Assessing the impact of Assistive Technology (AT) on a person's function is a significant problem that must be addressed when developing a rehabilitation outcome measure. Researchers at Boston University's SCIMS reported the success of the SCI-FI / AT (Spinal Cord Injury-Functional Index Computer / Assistive Technology) instrument. The SCI-FI /AT was developed specifically for use with individuals with SCI across all levels and extent of injury, with a sensitivity to changes in function, while also being practical for use in busy clinical settings. The SCI-FI focuses on providing a general measure of function for people with SCI while supporting the use of assistive technology. In doing so, the instrument provides a valuable approach for accurately measuring function and meaningful change in the way that individuals use assistive technology. This instrument allows clinicians to more accurately discuss the functional capabilities of the patient with them and their families. The utility of the instrument was demonstrated in a recent study: Jette, A. M., Slavin, M. D., Ni, P., Kisala, P. A., Tulsy, D. S., Heinemann, A. W., Charlifue, S., Tate, D. G., Fyffe, D., Morse, L., Marino, R., Smith, I., & Williams, S. (2015). Development and initial evaluation of the SCI-FI/AT. *Journal of Spinal Cord Medicine*, 38(3), 409–418.

- **New Tool Measures Quality of Life in Persons with SCI.**

Kessler Medical Rehabilitation Research and Education Corporation, Northern New Jersey Spinal Cord Injury System. (Grant # H133N110020). Researchers at the Kessler Foundation and its Institute for Rehabilitation Research contributed to the development of the SCI Quality of Life instrument. This tool is a measurement system developed to address the shortage of relevant and psychometrically sound patient-reported outcome measures available for clinical care and research into SCI. The system provides an innovative, psychometrically rigorous and highly useful method that will revolutionize the assessment of self-reported outcomes for persons with SCI. The system builds on the capacity of the rehabilitation research field by providing a valid and reliable means of assessing aspects of health-related quality of life—a key outcome measure for epidemiological and intervention studies of persons with SCI. The findings relating to this measurement system were published in: Tulsy, D. S., Kisala, P. A., Victorson, D., Tate, D. G., Heinemann, A. W., Charlifue, S., Kirshblum, S. C., Fyffe, D., Gershon, R., Spungen, A. M., Bombardier, C. H., Dyson-Hudson, T. A., Amtmann, D., Kalpakjian, C. Z., Choi, S. W., Jette, A. M., Forchheimer, M., & Cella, D. (2015). Overview of Spinal Cord Injury – Quality of Life (SCI QOL) measurement system. *Journal of Spinal Cord Medicine*, 38(3), 257–269.

- Convenient Checklist Keeps Wheelchairs at Top Performance.**
University of Pittsburgh (Grant # 90DP0025). Researchers at the University of Pittsburgh developed the Wheelchair Maintenance Assessment Tool (W-MAT), a wheelchair inspection checklist to assess the condition of a wheelchair and its parts. The checklist identifies problems related to component failure in power and manual wheelchairs and serves as a useful risk assessment for the prevention of wheelchair-related injuries. Research has shown that between 44 and 57 percent of people with SCI have required at least one wheelchair repair in a six-month period and between 22 and 30 percent of those who needed repairs also reported being stranded; missing appointments, school, or work; or being injured due to this needed repair. Additionally, lack of maintenance has been linked to a tenfold increase in likelihood of being injured. The W-MAT is designed for a broad audience, increasing its versatility. By improving knowledge of wheelchair maintenance, wheelchair users can more quickly address issues and decrease the number of repairs and accidents. The W-MAT was presented at the 2015 International Seating Symposium Workshop “Basic Wheelchair Maintenance Training for Manual and Power Wheelchair Users.” The article discussing the tool is currently in press: Toro, M. L., & Pearlman, J. (*In Press*). Development of a manual wheelchair and power wheelchair maintenance program. *Proceedings of the Rehabilitation Engineering and Assistive Technology Society of North American Conference*. June 10–14, 2015, Denver, CO.

Advanced Rehabilitation Research Training Projects (ARRTs)

ARRTs seek to increase capacity for high-quality rehabilitation research by supporting grants to institutions to provide advanced research training to individuals with doctorates or similar advanced degrees who have clinical or other relevant experience. Grants are made to institutions to recruit qualified persons, including individuals with disabilities, and to prepare them to conduct independent research related to disability and rehabilitation, with particular attention to research areas that support the implementation and objectives of the Rehabilitation Act and that improve the effectiveness of services authorized under the Act. This research training may integrate disciplines, teach research methodology, and promote the capacity for disability studies and rehabilitation science. Training projects must operate in interdisciplinary environments and provide training in rigorous scientific methods.

There were 87 Fellows enrolled in the ARRT program under 23 active awards. Twenty-six of these Fellows were completing their programs during FY 2015. Fellows contribute to and lead multidisciplinary research projects with mentors and peers and are encouraged to publish their research. In FY 2015, Fellows authored approximately 31 publications and contributed to another 13. The program supports a diverse cadre of young research professionals. An estimated 47 percent of Fellows in the ARRT funding program identify themselves as Latino, African American, American Indian, Asian, or Native Hawaiian.

AN ESTIMATED 47 PERCENT OF FELLOWS IN THE ARRT FUNDING PROGRAM IDENTIFY THEMSELVES AS LATINO, AFRICAN AMERICAN, AMERICAN INDIAN, ASIAN, OR NATIVE HAWAIIAN.

Following are examples of key research accomplishments, reported to NIDILRR during FY 2015, resulting from investments in the AART program. Each of the accomplishments reflects the work of not only the AART Fellows, but also the mentors and senior research scientists that influence and guide their work.

- **Guidance Issued for the Reliable Assessment of Depression in People with Multiple Sclerosis. University of Washington (Grant # 90AR5013).** Investigators from the University of Washington published an article evaluating the psychometric properties of the Patient Health Questionnaire-9 (PHQ-9), the Center for Epidemiological Studies Depression Scale-10 (CESD-10), and the eight-item Patient-Reported Outcomes Measurement Information System Depression Short Form (PROMIS-D-8) in individuals living with multiple sclerosis. All three instruments demonstrated strong scores on reliability and validity assessments. Findings suggest that these can be used interchangeably and with confidence by practitioners. Further, the study provides evidence to support the tools' compatibility with PROMIS measures in the U.S. and abroad. This research shows the tools' similar ability to detect depression, supporting PROMIS validity in cross-national comparisons for measuring depression in clinical settings. These findings have been used by researchers and medical practitioners inquiring about the psychometric reliability and validity of the PROMIS measures in the United States and Spain. The full citation is: Amtmann, D., Kim, J., Chung, H., Bamer, A. M., Askew, R. L., Wu, S., Cook, K. F., & Johnson, K. L. (2014). Comparing CESD-10, PHQ-9, and PROMIS depression instruments in individuals with multiple sclerosis. *Rehabilitation Psychology, 59*(2), 220–229.
- **A Comparative Analysis of Adult Siblings' Perceptions Toward Caregiving. University of Illinois (Grant # 90AR5007).** Siblings of individuals with IDD are likely to become caregivers for their brothers and sisters. Their expectations of and experiences with caregiving, however, may be different. Fellows from the University of Illinois used focus groups to compare the perspectives of siblings who were current caregivers to siblings who anticipated becoming caregivers. Responses were compared and contrasted across four areas: caregiving responsibilities, rewards, challenges, and opinions toward being paid as a caregiver. Both groups were knowledgeable about and invested in their brothers and sisters and reported that they enjoyed bonding with them. For current caregivers, challenges were related to understanding and navigating the service system. In contrast, anticipated caregivers were concerned about planning for the future. Mixed viewpoints were expressed about receiving pay for providing care although a greater number of current caregivers were receptive to it. This study provided valuable information for developing responsive interventions and support for the growing number of individuals caring for siblings. The full citation is: Burke, M. M., Fish, T., & Lawton, K. (2015). A comparative analysis of adult siblings' perceptions toward caregiving. *Intellectual and Developmental Disabilities, 53*(2), 143–157.
- **Special Ultrasound Captures Changes in Stroke-Affected Muscles to Aid in Rehabilitation and Treatment. Northwestern University (Grant # 90AR5010).** Researchers at Northwestern University used shear wave (SW) ultrasound elastography to examine muscle stiffness and composition in stroke-impaired muscle. The researchers found variation in SW speed and intensity measurements across the biceps muscle of the paralyzed limb compared to the non-paralyzed

limb of stroke survivors when the muscle is at rest. The outcomes suggest that paralyzed muscles may have an altered composition resulting in stiffness, which may be measured with SW elastography. Many aspects of rehabilitation therapy attempt to increase range of motion related to muscle stiffness. Clinicians and rehabilitation professionals can make more informed treatment decisions when they understand the change in their patients' muscles, and the potential causes. Findings from this research highlight the potential for SW elastography to be used as a tool for both investigating the mechanisms behind changes in stroke-impaired muscles, and for evaluating muscle mechanical properties as part of clinical examination or therapy. The full citation for this research is: Lee, S. S. M., Spear, S., & Rymer, W. Z. (2015). Quantifying changes in material properties of stroke-impaired muscle. *Clinical Biomechanics*, 30(3), 269–275.

- **Robotic Arm Minimizes the Weight Load for Caregivers of Individuals with Disabilities.** **University of Pittsburgh (Grant # 90AR5021).** Researchers at the University of Pittsburgh examined the stability of a newly developed “Strong Arm,” a robotic arm that is attached and integrated with an electrical-powered wheelchair to assist with transfers, such as from the chair to a bed. Experiments that applied different loads and used various system configurations were used to analyze system stability. When real transfers were conducted with 50 and 75 kg loads and an 83.25 kg dummy, the current Strong Arm could transfer all weights safely without tipping over. The modeling accurately predicted the stability of the system, providing a foundation for developing better control algorithms to further improve the safety of the arm. The Strong Arm strengthens the ability of caretakers, family caregivers, or other assistants to more easily lift and transfer individuals with disabilities without risking injury. The device was patented and recently licensed to a robotic company for commercialization. A detailed review of this research is published in: Wang, H., Tsai, C.-Y., Jeannis, H., Chung, C.-S., Kelleher, A., Grindle, G. G., & Cooper, R. A. (2014). Stability analysis of electrical powered wheelchair-mounted robotic-assisted transfer device. *Journal of Rehabilitation Research and Development*, 51(5), 761–774.

Research Fellowship Program (Mary E. Switzer Fellowship Program)

The Mary E. Switzer Fellowship Program seeks to increase capacity in rehabilitation research by giving qualified individual researchers, including individuals with disabilities, the opportunity to develop new ideas and gain research experience. Awards go directly to individuals, not their institutions, allowing Fellows to pursue independent research activities and training interests with more freedom at their hosting institution. Distinguished Fellows are seasoned in their careers, must hold a doctorate or comparable academic status, and have had seven or more years of experience relevant to rehabilitation research. Merit Fellowships are given to persons with rehabilitation research experience who do not meet the qualifications for Distinguished Fellowships, usually because they are in earlier stages of their careers. Fellows work for one year on an independent research project of their design. Individuals with disabilities are encouraged to apply for each of these Fellowships.

A total of 15 Fellows submitted an annual or final performance report in FY 2015. Three of the Fellows self-identified as a racial and/or ethnic minority. Similar to ARRT Fellows, Switzer Fellows were actively engaged in independent and partnership research, resulting in seven peer-reviewed articles, four measurement tools or technology products, and three information products. Switzer Fellows have gone on to hold prominent positions, primarily on the tenure track in academic research institutions, but also in hospital centers or in the private sector for biotechnology companies.

Examples of past Switzer Fellows' work include Dr. Shivayogi Hiremath's publication, "*How Much Physical Activity Do You Do?*", which reports findings on a physical activity accelerometer that can be attached to a wheelchair to track activity. The device lets users log their activity using their Smartphones, promoting healthy activity levels, a common challenge for wheelchair users.

SWITZER FELLOWS HAVE GONE ON TO HOLD PROMINENT POSITIONS, PRIMARILY ON THE TENURE TRACK IN ACADEMIC RESEARCH INSTITUTIONS, BUT ALSO IN HOSPITAL CENTERS AND IN THE PRIVATE SECTOR FOR BIOTECHNOLOGY COMPANIES.

Researchers from the RRTC on Developing Strategies to Foster Community Integration and Participation for Individuals with TBI credit former Switzer Fellow Dr. Kacey Little Maestas for completing foundational research that led to the development of an English and Spanish-language manual to help parents with TBI address common challenges.

An example of a Switzer accomplishment reported to NIDILRR during FY 2015 follows:

- **Improving Patient Participation in Inpatient Rehabilitation of Individuals with SCI.** **Washington University, School of Medicine (Grant # 90SF0003).** Switzer Research Fellow Dr. Alex Wong, a postdoctoral Fellow at the Rehabilitation Institute of Chicago, now at Washington University, presented the background, rationale, and expected results of his Fellowship project at the 2015 OT Summit of Scholars, an investigation into the impact of patient engagement on outcomes of individuals with SCI at one-year post-injury. His presentation described subgroups of engagement over the course of inpatient rehabilitation, factors associated with changes in engagement, and anticipated relationships with participation in the community. Dr. Wong's presentation was intended to benefit rehabilitation educators and researchers by identifying targets of interventions for boosting patient engagement that lead to improved participation outcomes of persons with SCI.

Section 21

NIDILRR's Capacity Building research agenda, as identified in its Long-Range Plan, includes a section focused on developing the talent of future leaders in rehabilitation research and development, including individuals with disabilities and those from minority backgrounds. This part of the plan also supports NIDILRR's mandate under Section 21 of the Rehabilitation Act to set aside one percent of its annual appropriations to address traditionally underserved populations. The Section 21 program focuses on

research capacity building for minority entities such as Historically Black Colleges and Universities and institutions serving primarily Hispanic, Asian, and American Indian or Alaska Native students, and non-minority entities with an interest in improving understanding about the needs and outcomes of individuals with disabilities from minority populations. Program activities include assisting minority entities with networking that supports enhanced collaboration between minority entities and non-minority entities, and the exchange of expertise and advanced training across program areas.

Over the past fiscal year, NIDILRR has enhanced its efforts under the Section 21 program by implementing specific strategies aimed at increasing minority participation and representation throughout the NIDILRR portfolio and increasing knowledge of NIDILRR funding programs among minority-serving institutions. As part of this initiative, NIDILRR conducted three competitions during FY 2015 to improve the quality and use of research related to individuals with disabilities from traditionally underserved racial and ethnic populations, and to enhance the opportunity for minority entities to conduct such research across various NIDILRR funding mechanisms. Three grants were funded under the FIP, ARRT, and RRTC grant mechanisms. One of these grants is an RRTC on Research and Capacity Building for Minority Entities at Langston University. This grant examines the experiences and outcomes of individuals with disabilities from traditionally underserved racial and ethnic populations and also researches the feasibility and potential effectiveness of methods and models to enhance disability and rehabilitation research capacity and infrastructure of minority entities.

The following accomplishments are from the RRTC on Research and Capacity Building for Minority Entities:

- **National Investigation of Factors that Contribute to Minority Disability and Rehabilitation Research Leaders' Career Development and Success.**
Langston University (Grant # 90RT5024). Langston University conducted a study to document factors that contribute to the career development and overall success of research leaders from traditionally underrepresented populations. This study involved the analysis of qualitative data from in-depth telephone interviews with 15 minority disability, health, and rehabilitation research leaders from around the country. Among several individual sociocultural-level key findings, many interviewees identified cultural, language, and family life issues, and the lack of collaboration opportunities among colleagues as critical research career development challenges. The institutional-level research environment obstacles to career development identified by informants included bureaucracies, alienation, heavy teaching loads, insufficient research support funds, racial and ethnic discrimination, limited research mentorship opportunities, unhealthy competition, and the lack of a critical mass of researchers of color. Interviewee responses raised two issues growing out of federal research agency policy and systems: (1) the current inadequate supply of minority research leaders, and (2) the lack of equal opportunity in access to funding and resources. A manuscript developed from the synthesis of the literature was accepted for publication in the *Journal of Rehabilitation*. Additionally, the RRTC is conducting a qualitative case study into the effects of the Institutional Research Capacity-Building and Infrastructure Model on research participation. Study findings will have implications for the development of strategies to improve core research skills, administration practices, and many other areas.

- **Advanced Research Training Provided to Researchers Focusing on TBI and Sports-Related Concussion.**

University of Texas – El Paso (UTEP) (Grant # 90AR5016). UTEP is providing a multidisciplinary training for postdoctoral research Fellows to develop advanced scientific methodological skills in a community-based research setting. Training Fellows have engaged in projects focusing on motor speech disorders, the bilingual impact on baseline testing, developing an inexpensive procedure for assessing balance, investigating simple word recall procedure for identification of concussion, and more. One research Fellow designed and initiated a research project in a partnering district investigating the academic and social performance impact of sports-related concussion among high school student-athletes. Of the six postdoctoral Fellows expected to be recruited for UTEP’s training program, two have accepted faculty positions after a year of supported training.

Ongoing NIDILRR Activities and Initiatives

As can be gleaned from the collection of accomplishments presented across NIDILRR’s funded programs in this report, grantees are engaging in far-reaching, compelling, and impactful research that is affecting individuals with disabilities, their families, the care teams that serve them, and the broader community. Robotic arms to assist with transfers, accessibility checklists, depression measurement tools for people with multiple sclerosis, interventions on interpersonal violence, economic models that measure savings from vocational rehabilitation investments, and other novel inventions produced by NIDILRR grantees are creative solutions to real challenges faced on a day-to-day basis by individuals with sensory, mental, physical, and developmental/intellectual disabilities. NIDILRR’s sponsorship of training and technical assistance through the ADA National Network further exemplifies the agency’s involvement in activities aimed at empowering and educating individuals with disabilities, employers, and the public about their rights and responsibilities under the ADA. Lastly, NIDILRR’s research capacity-building activities are creating a skilled, diverse cadre of scientists and future leaders who are committed to advancing disability research that matters.

NIDILRR has begun strategic planning efforts to develop its 2018–2022 Long-Range Plan. Significant changes in this upcoming planning process are expected due to the implementation of WIOA and the resulting transfer of NIDILRR from ED to HHS/ACL, as mandated by the law. The long-range plan will provide an organizational and programmatic vision for the agency as it continues its mission to generate new knowledge and to promote its effective use to improve the abilities of individuals with disabilities to perform activities of their choice in the community, and to expand society’s capacity to provide full opportunities and accommodations for its citizens with disabilities. Planned activities for the development of the long-range plan include the participation of internal work teams and external advisory groups to assess the current and emerging state of the science in order to inform the development of strategic goals and objectives for the organization. NIDILRR is committed to ensuring that the long-range plan development process is systematic, transparent, and inclusive.

NIDILRR has an extensive history of collaborating across federal departments to identify best practices, conduct co-sponsored research, and address shared goals. Well-established partnerships exist both within HHS and with agencies in different federal departments. The Interagency Committee on Disability Research (ICDR), a NIDILRR-led Federal partnership, is charged to promote a cohesive, strategic federal program of disability, rehabilitation, and independent living research; broker partnerships; and facilitate coordination and collaboration among federal departments and agencies conducting such research. NIDILRR also possesses Interagency Agreements or Memoranda of Understanding with the Department of Veterans Affairs, the Centers for Disease Control and Prevention, the Substance Abuse and Mental Health Services Administration, the National Institute of Standards and Technology, the Department of Transportation, the Access Board, and the Federal Communications Commission. NIDILRR intends to develop new and existing collaborations with other agencies within HHS, and across the federal government, in order to capitalize on synergies within research goals and activities.

In addition to clarifying its research priorities, NIDILRR will be examining its administrative processes as a component of the Long-Range Plan in order to identify approaches to refine its workflow to better meet performance expectations, and to optimize organizational efficiency and internal controls. An extension of this focus will be optimizing its knowledge, data, and administrative management practices and policies to enable efficiency in the short term, and to aid in the successful transfer of programmatic and institutional knowledge during staff and leadership succession.

NIDILRR will continue to be a leading sponsor of disability, independent living, and rehabilitation research through its annual grant-funding competitions. As a component of this effort, it will continue to actively include its stakeholders in all aspects of its work, including setting clear standards for grantees. Funding priorities will be established by NIDILRR, with consultative input from an advisory committee that includes NIDILRR leadership, researchers, and representatives from disability groups. Efforts to expand the participation of individuals with disabilities, racial and ethnic minorities, and/or underserved populations in NIDILRR's research activities are planned. At present, the agency requires grantees to document and report efforts at including persons with disabilities in any capacity, such as by seeking their participation in an advisory committee, soliciting their guidance in the research or development design, recruiting them to help with the dissemination of materials and outputs, employing individuals with disabilities, and recruiting them as research subjects.

NIDILRR is continuing to refine its approach to evaluating research and development projects from their early design and concept, to prototype or intervention, all the way to dissemination of knowledge or a product into the community. This is accomplished by formulating frameworks to evaluate research and development projects across distinct stages. NIDILRR promotes the use of four Stages of Research: (1) Discovery and Exploration, (2) Intervention Development, (3) Intervention Efficacy, and (4) Scale-up Evaluation. The Stages of Research are used to structure and improve solicitations, expert recruitment for peer-review panels, peer-review protocols, annual reports, grant monitoring, performance metrics, strategic planning, and dissemination of findings. They comprise a typical logical order for research activities that allow one stage of research to build upon the findings from prior stages of research. Like the Stages of Research, NIDILRR recently proposed three Stages of Development: (1) Proof of Concept, (2) Proof of Product, and (3) Proof of Adoption. Similar to the Stages of Research, development projects may cross one or more grants and can encompass one or more stages. These frameworks will contribute

to enhanced quality across NIDILRR's funded projects, and signify that NIDILRR's sponsored work, as a whole, is building toward products and evidence-based interventions that improve the lives of people with disabilities.

Active outreach to the broad disability community, which includes recruitment of emerging researchers, establishing partnerships with disability leaders, and disseminating research findings and generated knowledge, will continue to be a focused undertaking by NIDILRR. An outreach campaign is a planned component of the agency's FY 2018–2022 Long-Range Plan. As a result of NIDILRR's transfer to ACL, ACL is now required to comply with the White House Office of Science and Technology Policy. This requires federal agencies with research and development budgets greater than \$100 million per year to maximize, to the extent allowable by law, free public access to peer-reviewed scientific publications and findings produced as a result of federally funded research. In FY 2016, NIDILRR will implement its plan to promote public access to its grant-funded publications, and will finalize its process to facilitate access to scientific data. This should facilitate access to NIDILRR-funded research, expanding its reach, and providing additional value to the disability community.