The Research Computing Division

Established in 1958, Research Triangle Institute is an independent, nonprofit research institute dedicated to improving the human condition. Created by leading universities in North Carolina, RTI is rooted in North Carolina and headquartered in Research Triangle Park. We have grown into a world-class organization with offices in 12 U.S. and 10 international locations. Our staff of approximately 5,000 employees worldwide provides reliable data, thorough analysis, innovative methods, novel technologies, and sustainable programs to help governments and businesses in more than 75 countries address complex social and scientific challenges.

Overview

The Research Computing Division (RCD), RTI International's information technology (IT) resource, provides a full range of computing and technology solutions to projects and overhead initiatives conducted by staff in research units across RTI. RCD staff lead and collaborate on projects, engaging in a broad spectrum of research areas—we are always interested in expanding our reach internally and externally, domestically and globally. RCD's staff of approximately 150 get to know one another and learn more about the Institute and the division's business at quarterly all-hands meetings and regular social events.

RCD Programs and Services

Bioinformatics

Our bioinformatics program produces innovative bioinformatics analysis and new software tools. The program's scientists have expertise in areas such as genomics, toxicology, data management, tool development, and software engineering. We work with other collaborators to develop resources and bioinformatics tools that enable researchers to better understand and address complex research questions while protecting privacy and confidentiality.

Data Integration, Reporting, and Analytics

We build robust business intelligence systems that help our federal clients monitor and improve the performance of service providers at both state and local levels. We collect and manage data for the National Survey on Drug Use and Health (NSDUH), the nation's largest survey of drug use and health, and also for forensic laboratories across the nation. RTI-built systems securely store and share data with researchers, administrators, and members of the public—plus, we work with scientists around the country to establish standards that promote open science by making data easier to find, view, and use.

Information and Communication Technology (ICT)

For more than two decades, RTI has helped developing countries achieve their priorities by using ICT to address challenges in health, education, governance, economic growth, agriculture, and the environment. Our ICT program's strengths include implementing sustainable, scalable solutions within national frameworks; creating powerful ICT tools to improve the quality, timeliness, and use of health information at all levels; and developing mobile applications (apps) that help countries measure and improve student performance in early grade reading and mathematics.

Cloud Computing

We responded quickly when the U.S. government announced its Cloud First policy, helping our clients migrate existing systems and launch new projects securely and cost-effectively. Our cloud expertise has helped us replace three reporting systems with a single system to aggregate and report on performance data from federal grantees, manage the data analysis system for a huge study of child health outcomes, and develop a system to pay teachers who take part in program trainings in developing countries via a mobile money transaction.

Mobile Technology

RCD has pioneered in mobile computing apps for field surveys, personal health interventions, education assessments, teaching and learning, disease surveillance, and other needs. A special strength is collecting and managing data in low-resource settings.

Project Management and Documentation

RCD's IT project managers are certified Project Management Professionals who work closely with project teams to maintain schedules, track costs, manage subcontractors, and monitor content and quality control. Our IT documentation specialists manage project information required to conduct tasks, document progress, communicate with clients, produce deliverables, and store project-related emails, analytic programs, and files.

Survey Data Collection

A hallmark of RTI's 60-year history is managing high-profile surveys such as NSDUH. We use advanced data collection systems and techniques to complete accurate, cost-effective surveys of all sizes for both public- and private-sector clients.

Web Applications

Our web application developers apply the principles of user-centered design to build systems that support collaborative research, data collection, content management, and analysis applications for clients across the federal government, academia, and the private sector.

Software Quality Assurance (SQA)

Our SQA group offers full-cycle testing and quality assurance services for desktop, web, and mobile applications. The SQA group also provides data security services for RTI's federal projects.

Project Highlights

PhenX (consensus measures for **Phen**otypes and e**X**posures) is a major initiative of the U.S. National Institutes of Health that seeks to realize greater efficiency in government-supported biomedical research. Under a cooperative agreement with the National Human Genome Research Institute, RTI facilitates the expert consensus process and develops the online PhenX Toolkit (https://www.phenxtoolkit.org/) to improve the consistency of data collection, facilitate cross-study analyses, and help investigators identify opportunities for collaborative biomedical research. The Toolkit currently contains nearly 800 protocols and more than 550 measures spanning 25 research domains and five special collections.

Substance Abuse and Mental Health Services Administration's (SAMHSA's) Performance Accountability and Reporting System (SPARS). RTI designed, developed, and maintains SPARS—the mechanism by which SAMHSA aggregates and reports on performance data from the grantees it funds. At the core of SPARS is a cloud-hosted architecture with layers of databases, application servers, and data warehouses tuned to deliver a highly available suite of integrated applications for reporting and analytics. Powerful SPARS data visualizations benefit greatly from the cloud-hosted system's flexibility and expandability, providing users and clients with better insight into their study data. Additional SPARS features include an online learning system, multifactor authentication, and an ad hoc reporting suite.

The Sauver avec l'Azithromycine en Traitant les Femmes Enceintes et les Enfants (SANTE) study will assess the efficacy of presumptive oral azithromycin to prevent stillbirths and mortality through 6–12 months of age in rural Mali, where rates of infant and under-five mortality are among the highest in the world. RTI is developing an offline data collection system with a web component for lab results, managing data, delivering in-country training, and providing independent site monitoring in support of a four-arm randomized controlled trial. In addition, RTI will collaborate with researchers at the University of California, San Diego, to explore the incorporation and evaluation of biometric technologies for the identification of infants. The project presents a unique opportunity to extend RTI's open-source Tangerine software, previously used primarily for educational assessments, to work effectively for longitudinal health research.

Global Adult Tobacco Survey (GATS). Under the Bloomberg Initiative to Reduce Tobacco Use, the GATS project has implemented RTI's General Social Survey (GSS) software on a global scale. The GATS GSS has been used to collect data in nearly 400,000 household surveys in more than 50 languages across 34 countries. The system allows in-country staff members to design and implement country-specific questionnaires, port the software to a handheld device, aggregate all field data into a single file, and integrate data with the sample file to create an analysis file. After winning the competition in 2007, our survey researchers and data scientists developed one of the first reliable and accurate systems for acquiring data using handheld devices.

National Survey on Drug Use and Health (NSDUH). RTI has developed a close partnership with SAMHSA to make NSDUH the federal government's primary source of data on substance abuse and mental health issues. NSDUH field interviewers, equipped with Android tablets and laptops, visit approximately 240,000 households annually to complete 67,500 interviews. This effort requires a complex IT infrastructure in a Federal Information Processing Standards (FIPS)-Moderate security environment, including specialized data collection hardware and

PHIT for Duty, a mobile app built on RTI's Personal Health Intervention Toolkit platform, was developed to prevent chronic psychological health issues in military personnel, including post-traumatic stress disorder. PHIT is deployed on smartphones or tablets as a self-help device to build resilience in healthy troops and to support prevention in high-risk personnel.

More Information

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software; data transmission systems; and data processing, analysis, and control software. The data collected in NSDUH's roughly 50 relational databases provide important insights on tobacco, alcohol, and illicit drug use; the nonmedical use of prescription drugs; and related mental health issues across the United States.

National Forensic Laboratory Information System (NFLIS). NFLIS is a U.S. Department of Justice (DOJ) Drug Enforcement Administration program that systematically collects results from drug chemistry analyses conducted by state and local forensic laboratories across the country. The NFLIS database contains more than 16 million drug cases with more than 26 million drug items/exhibits. Although participation is voluntary, 279 of the nation's approximately 295 individual crime laboratories participate in NFLIS, with 271 laboratories reporting data monthly. We developed the NFLIS website, including a powerful and versatile web-based analytical tool—the NFLIS Data Query System—that program staff members, the DOJ, and other stakeholders use to conduct standard and customized remote analyses.

ECHO Data Analysis Center. Partnering with Johns Hopkins University, RTI serves as the data analysis center for the Environmental Influences on Child Health Outcomes (ECHO) study. We provide data harmonization, epidemiology, and biostatistics services to support longitudinal and multilevel analysis. To expand ECHO's analysis capabilities efficiently, we are developing a novel, flexible, and secure data infrastructure to serve as a resource for pediatric health. Partnering with Microsoft, RTI created a privately accessible Azure cloud network, making all of Azure's cloud capabilities directly available to RTI development teams. The private access runs through RTI's proprietary Federal Information Security Management Act (FISMA) Moderate network, and researchers work within this secure network to analyze data in ECHO's data lake and other large-scale databases.

RCD staff members are developing an offline data collection system and testing biometric technologies to identify infants as part of a clinical trial to assess the efficacy of presumptive oral azithromycin to prevent stillbirths and mortality through 6–12 months of age in rural Mali, where rates of infant and under-five mortality are among the highest in the world.

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