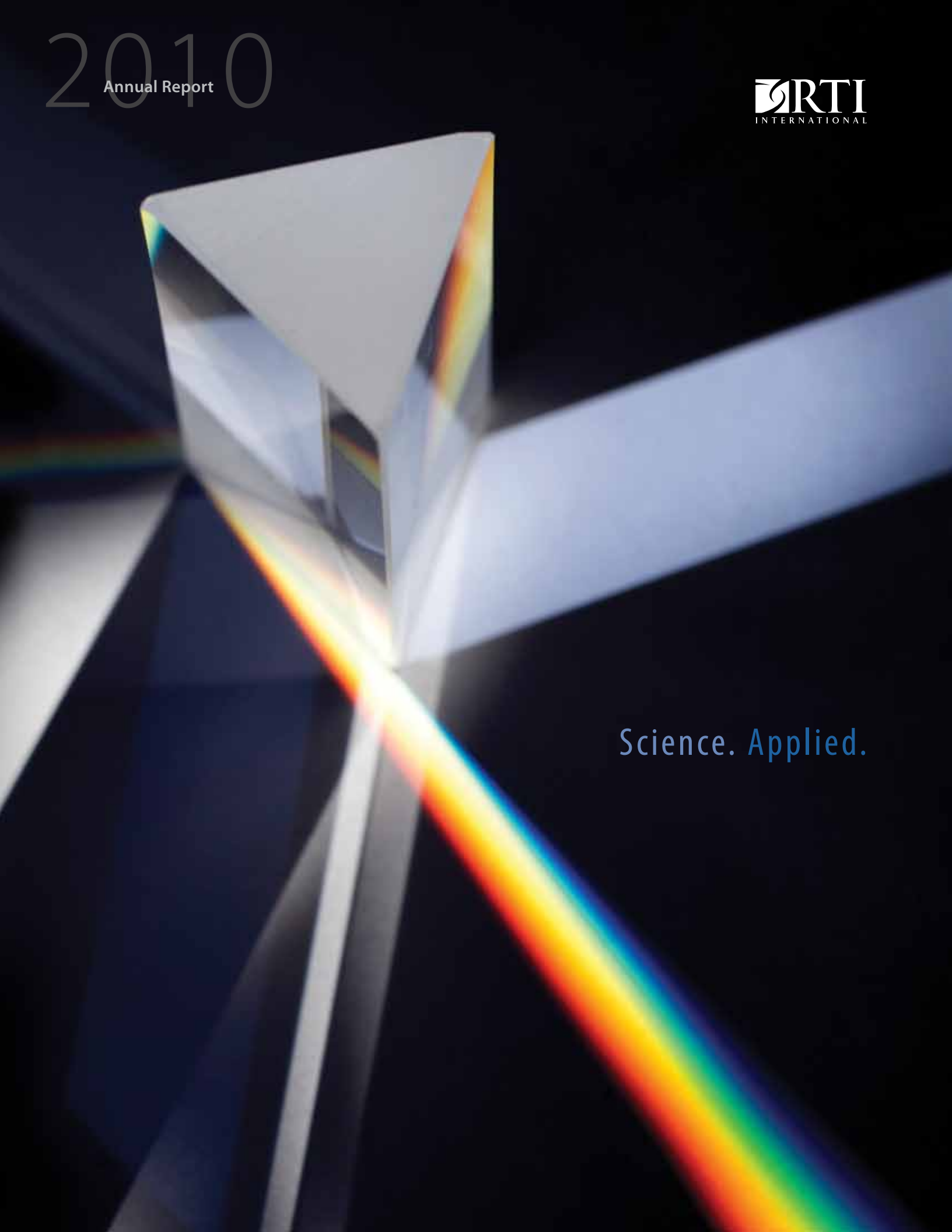
2010

Annual Report

RTI INTERNATIONAL



Science. Applied.

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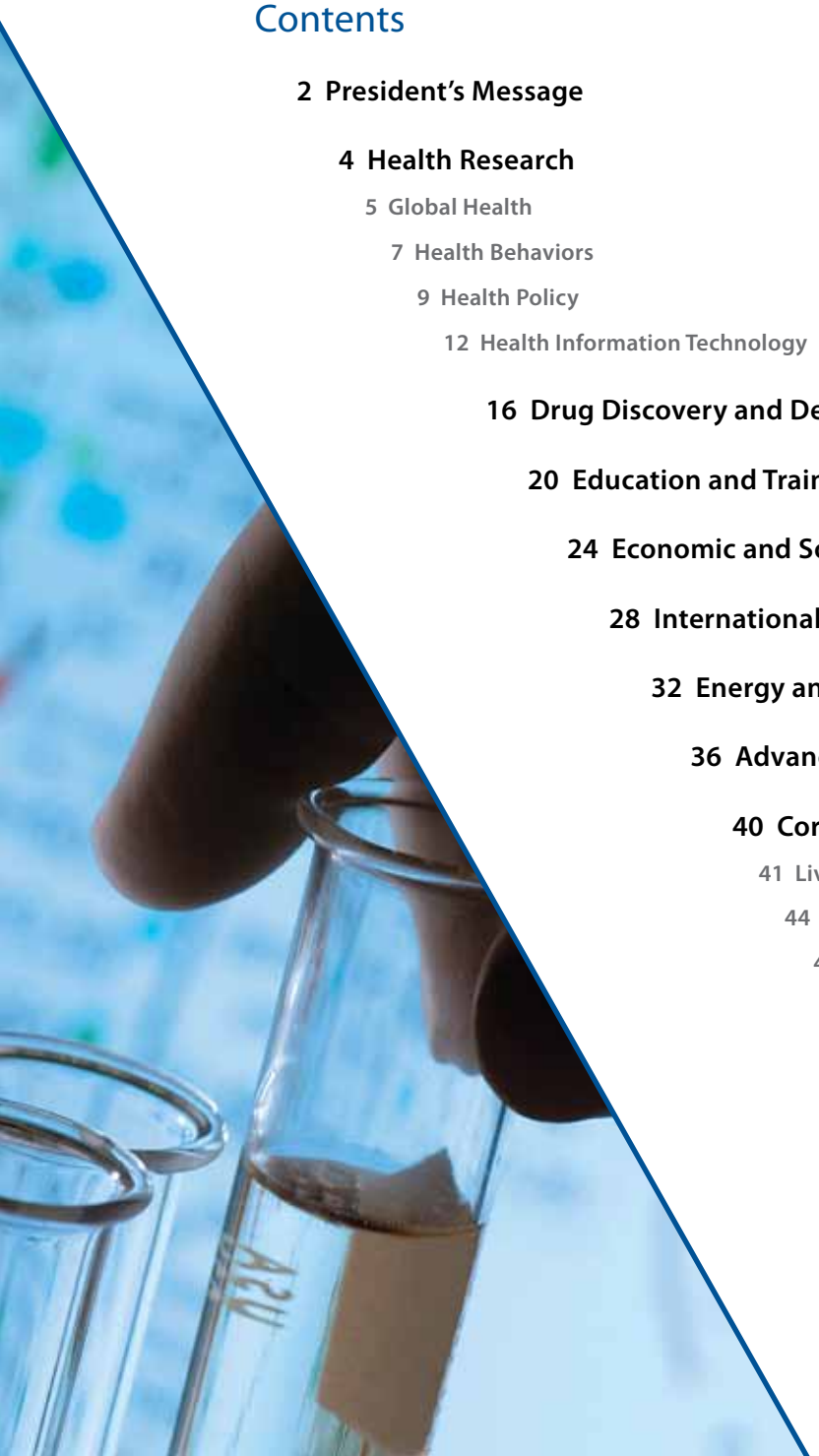
Science: A system of knowledge covering general truths or the operation of general laws, especially as obtained and tested through the scientific method

Applied: Put to practical use; applying general principles to solve identifiable problems

At RTI International, our researchers and technical staff apply their scientific expertise and in-depth knowledge to address some of the world's most complex challenges. The image on the cover of this year's annual report is symbolic of the multidisciplinary nature of our work and the rigorous scientific method that infuses every project we undertake. Our 2010 annual report shines a light on selected projects, achievements of our staff members, and our corporate responsibility program.



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turning knowledge
into practice

President's Message

During FY2010, RTI International continued to grow and evolve to meet the changing needs of our clients and society. We enjoyed a successful year across a wide range of programs, as we continued to apply rigorous scientific method and best practices in the pursuit of our mission.

During FY2010, RTI continued to grow and evolve to meet the changing needs of our clients and society. We enjoyed a successful year across a wide range of programs, as we continued to apply rigorous scientific method and best practices in the pursuit of our mission.

Significant milestones included establishing a new research center dedicated to advancing health information technology and, together with our founding universities, launching the Research Triangle Solar Fuels Institute, whose goal is to produce liquid transportation fuel directly from sunlight. We were also very pleased to receive Department of Energy funding to apply our patented technology for cleaning coal-derived synthesis gas at a 50-megawatt commercial power plant in Florida.

Our international health and education programs had a tremendous positive impact in developing nations. Through two programs funded by the U.S. Agency for International Development, we have helped treat more than 68 million people for neglected tropical diseases and protected more than 128 million people in 16 African nations from malaria-carrying mosquitoes. Our experts are leading innovative projects in Africa and Asia to improve the quality of education by better equipping classrooms and strengthening teacher skills in areas such as math and science.

In the coming year, we will strengthen our life sciences and biotechnology research programs and expand our laboratory-based capabilities to conduct research in health, genetics, and personalized medicine.

We look forward to the challenges and opportunities that await us in the coming year. We are confident in our science, and its application remains the key to our success.

Victoria Franchetti Haynes

Victoria Franchetti Haynes
President and Chief Executive Officer
RTI International

making the world a healthier
place to live

Health Research

For more than 50 years, RTI International scientists and researchers have been applying science to solve health problems around the world. During FY2010, we continued our work to develop and implement HIV prevention strategies, monitor Americans' substance abuse, analyze health care spending, and integrate electronic health care records into medical practices.

Global Health

For more than three decades, RTI has been committed to improving the health of millions of the world's poorest people through collaborative partnerships with local communities, national governments, civil society organizations, and private-sector counterparts.

Strengthening Local Governance in the Philippines to Improve Health Care

Since 2006, our staff members have used their expertise in building strong local governments and conducting health research to strengthen the ability of local governments in the Philippines to improve health care.

Following the devolution of health services from the central government to local governments in 1991, health care continued to remain below standard as local governments struggled to plan, finance, and deliver health services.

With funding from the U.S. Agency for International Development, RTI is implementing the Philippines Strengthening Local Governance for Health project, or HealthGov. Our researchers have been building local capacity to manage and finance health systems and services in more than 600 municipalities and cities in 25 provinces in the Philippines. These health services reach more than 36 million people.

HealthGov has developed tools and established systems to improve the review and analysis of the delivery of health services, enhance local government investment planning through monitoring of annual operational activities, strengthen local health information systems to support planning, and improve the management of health care service delivery.

HealthGov has also implemented plans to improve delivery of family planning services in an effort to increase contraceptive prevalence rates and integrate family planning services as a component of the local government's maternal, newborn, and child health and nutrition strategy. To date, HealthGov has facilitated the formulation of contraceptive self-reliance plans in 18 provinces and 359 cities and municipalities.

In 2011, the final year of the project, the HealthGov team will work toward establishing service delivery improvement tools within the Department of Health system, integrating enhanced province-wide investment plans for health into the local government units' planning and budgeting processes; improving the quality of family planning and maternal, newborn, and child health and nutrition data; and improving logistics management. At the same time, the project will expand the implementation of existing interventions to selected local governments.

Since 2006, our researchers have been building local capacity in the Philippines to manage and finance health systems and services that reach more than 36 million people.

Preventing the Spread of HIV in South Africa

RTI researchers, led by Wendee Wechsberg, PhD, continue to design and test biobehavioral research interventions to help prevent the spread of HIV and other infectious diseases. Building upon previous evidence-based studies, we adapted and refined interventions to meet the needs of numerous at-risk communities and the most at-risk populations.

During FY2010, our researchers worked in Cape Town, South Africa, to test and implement two community-based interventions funded by the National Institutes of Health. The Western Cape Women's Health CoOp and the newly

established Couples' Health CoOp are both designed to reduce HIV risk by addressing the role of alcohol and drugs, sexual relationships, gender roles, and gender-based violence in South Africa.

A five-year study, the Western Cape Women's Health CoOp began the experimental phase in 2008 and is working with South African women from many communities. The Western Cape Women's Health CoOp has reached more than 600 women during the study and is following up with them for 3-, 6-, 9-, and 12-month assessments. Biological testing for alcohol, drugs, and HIV is part of the protocol.

The Couples' Health CoOp, which began the experimental phase in 2010, is a five-year community randomized trial reaching men and their main female partners in Cape Town communities to reduce sexual risk behaviors, substance use, and violence. The first two years were spent developing and adapting an intervention for men and couples.

The Couple's Health CoOp addresses the aspects of partnerships that increase the risk of HIV transmission between a couple, such as multiple concurrent partnerships, serodiscordant couples, gender roles, sexual expectations, and cultural aspects that may impede traditional single-gender intervention efforts.

These interventions are conducted at community centers in the targeted areas.

Delivering New Drugs to Fight Tuberculosis

Led by Doris Rouse, PhD, researchers at RTI, as part of the Global Alliance for TB Drug Development, worked to test the effectiveness of the first new drug developed in more than 40 years to treat tuberculosis.

During a 14-day study conducted in 2007 with tuberculosis patients in South Africa, the drug, PA-824, demonstrated better than anticipated efficacy. This new drug could contribute substantially to shortening the duration of the standard tuberculosis treatment regimen, which is currently from six months to two and a half years.

The research showed that all of the doses of PA-824 compared well with the standard four-drug combination treatment in reducing tuberculosis in the lungs. A study of PA-824 given in combination with other drugs began in September 2010.

Our researchers worked in Cape Town, South Africa, to test and implement two community-based HIV prevention interventions.

William Zule, DrPH, (left) and Georgiy Bobashev, PhD, conducted a study that found that the type of syringe affects HIV transmission among intravenous drug users.

Results of a recent modeling study in Southeast Asia also suggested that new and improved tuberculosis drugs, vaccines, and diagnostics could reduce the global incidence of tuberculosis by up to 71 percent by 2050.

RTI assisted in the formation of the TB Alliance in 2000 and continues to assist in PA-824 licensing, drug development planning, and management. We serve as the regulatory contact with the U.S. Food and Drug Administration for PA-824.

The TB Alliance demonstrates the effectiveness of a new model for developing drugs through public-private partnerships. These partnerships have the potential to bring new, more effective, and affordable medicines to the public, including those most in need.

Tuberculosis kills nearly 2 million people every year and is second only to HIV/AIDS in mortality among infectious diseases. Ninety-four percent of tuberculosis cases occur in the developing world.

Health Behaviors

Our health behaviors researchers devote themselves to developing objective information about the variety of health behaviors that affect the cost of health care and the development and implementation of health interventions.

Reducing HIV Infection from Syringes

During FY2010, our researchers conducted two studies that will help guide syringe programs for intravenous drug users.

One study, conducted with San Francisco State University and the San Francisco Department of Public Health and led by RTI's Lynn Wenger, found that San Francisco's syringe exchange program has reduced the risk to community members from infectious syringes left by injecting drug users.

The study, published in the *American Journal of Public Health*, was based on a survey of more than 600 injecting drug users in San Francisco and a visual inspection of 1,000 city blocks in areas heavily trafficked by drug users.

The researchers found only 20 improperly disposed of syringes in San Francisco's high drug use areas, and the potential danger posed by these syringes was judged to be low because none of them had visible blood or exposed needles. The number of syringes found was small relative to the estimated 17,000 injecting drug users in San Francisco.

The second study, led by Georgiy Bobashev, PhD, and William Zule, DrPH, found that the type of syringe affects HIV transmission among intravenous drug users.

According to the authors, when a plunger on a syringe is fully depressed, all syringes retain fluid in what is called "dead space." High dead space syringes, which usually have detachable needles, retain more than 1,000 times more blood after washing than do low dead space syringes.

Our researchers found that even a small number of exposures involving high dead space syringes can increase the spread of HIV considerably, especially in high-risk populations.

Conversely, the study showed that injection-related HIV epidemics are likely to be controlled in areas or populations where 95 percent of syringe-sharing episodes use low dead space syringes.

The study, published in *Addiction*, used a mathematical model to illustrate the potential impact of syringe type on injection-related HIV epidemics in low- and high-risk intravenous drug user populations.

Monitoring Substance Use, Mental Health in the United States

A long-time leader in research of substance abuse and mental health, RTI has conducted research under contract with the Substance Abuse and Mental Health Services Administration (SAMHSA) since 1988, monitoring the nature, extent, and consequences of substance use and related mental health issues in the United States.

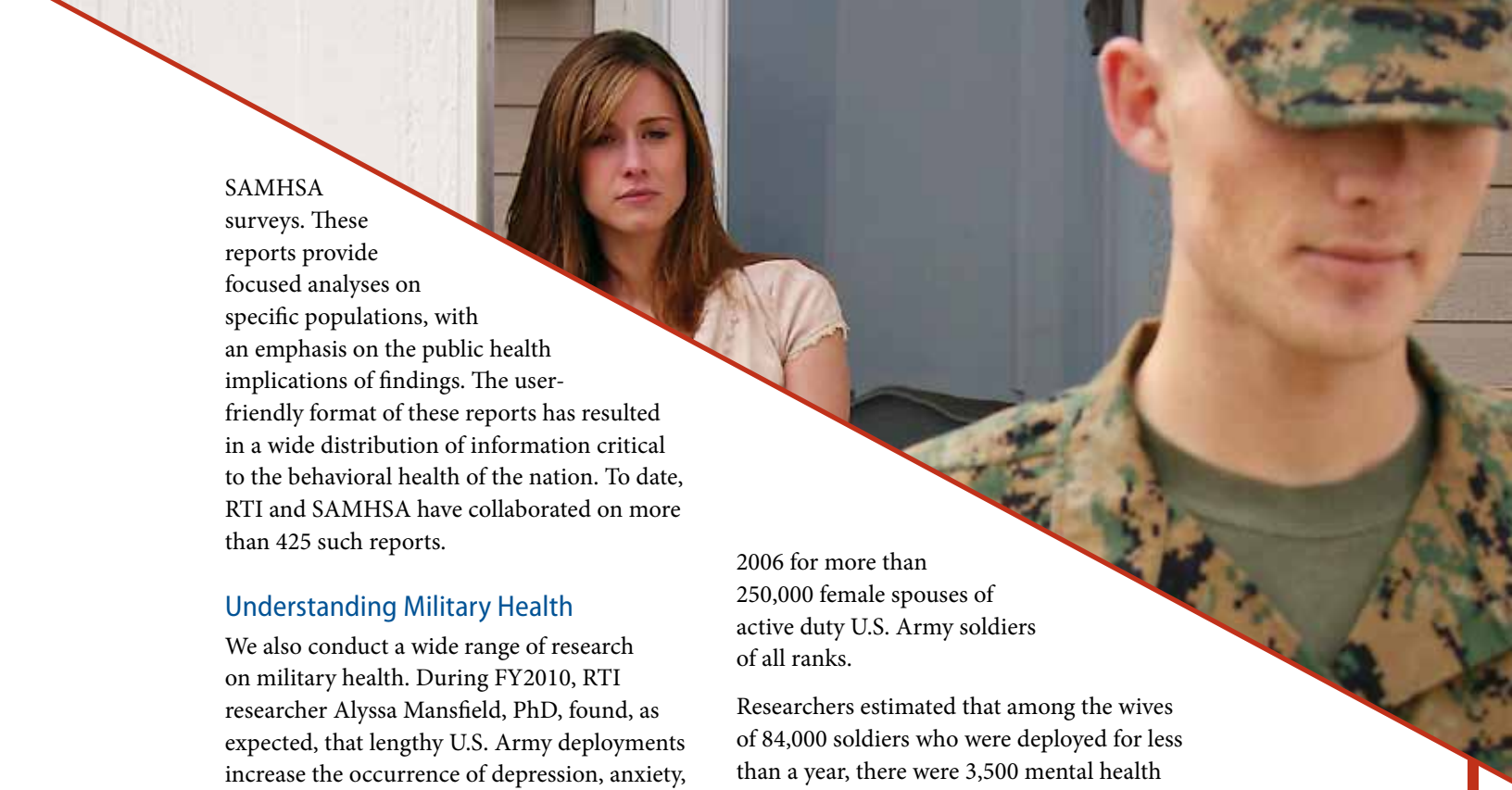
Completed annually since 1990, the National Survey on Drug Use and Health (NSDUH) provides national, state, and sub-state data on substance use and mental health in the noninstitutionalized civilian population age 12 and older. Approximately 67,500 people throughout the country complete the survey each year.

Many research communities, as well as federal and state agencies, use these data to examine emerging substance abuse and mental health issues and to design and evaluate prevention and treatment programs.

During FY2010, the NSDUH national findings report showed that the use of illicit drugs among Americans rose from 8 percent of the population age 12 and older in 2008 to 8.7 percent in 2009. This rise in overall drug use was driven in large part by increases in marijuana use. Also included in the increase in illicit drug use was an increase in the nonmedical use of prescription drugs, which rose from 2.5 percent of the population in 2008 to 2.8 percent in 2009.

Our researchers also collaborate with SAMHSA in the publication of a series of short reports using data from NSDUH and other

Allison McKamey (left) and Jody Greene work on two projects with SAMHSA that monitor and report the nature, extent, and consequences of substance use and mental health issues in the United States.



SAMHSA surveys. These reports provide focused analyses on specific populations, with an emphasis on the public health implications of findings. The user-friendly format of these reports has resulted in a wide distribution of information critical to the behavioral health of the nation. To date, RTI and SAMHSA have collaborated on more than 425 such reports.

Understanding Military Health

We also conduct a wide range of research on military health. During FY2010, RTI researcher Alyssa Mansfield, PhD, found, as expected, that lengthy U.S. Army deployments increase the occurrence of depression, anxiety, sleep disorders, and other mental health diagnoses for soldiers' wives left at home.

This study, conducted with researchers at the University of North Carolina at Chapel Hill and the Uniformed Services University of the Health Sciences, was published in the January 14 issue of the *New England Journal of Medicine*.

The study estimated the relationship between the time U.S. Army soldiers spent deployed and the use of mental health services and mental health diagnoses among their wives.

Results showed that women married to deployed soldiers more frequently used mental health services and were more likely to be diagnosed with conditions including depression, anxiety, sleep disorders, acute stress reaction, and adjustment disorders as compared with the spouses of non-deployed soldiers during the same time period.

Researchers also found that the longer soldiers were deployed, the more likely their spouses were to be diagnosed with a mental health condition and the more frequently they sought outpatient care for those diagnoses.

To conduct the study, researchers accessed data extracted from medical records for outpatient care received between 2003 and 2006 for more than 250,000 female spouses of active duty U.S. Army soldiers of all ranks.

Researchers estimated that among the wives of 84,000 soldiers who were deployed for less than a year, there were 3,500 mental health cases above the number reported for a similar number of wives of non-deployed soldiers during the same time period. Among the wives of 88,000 soldiers deployed for a year or longer, the number of additional mental health cases was 5,300.

Health Policy

Our health economists examine the underlying causes of the high cost of health care for diverse medical problems. Our research findings help policy makers decide how to allocate personal, technical, and financial resources to improve public health.

Analyzing Health Care Spending

During FY2010, RTI researchers, led by Wayne Anderson, PhD, conducted economic analyses to estimate health care spending associated with disability. Working with the U.S. Centers for Disease Control and Prevention, we found that disability-associated health care spending for U.S. adults totaled $397.8 billion in 2006, which was almost 27 percent of U.S. adult health care spending. New York had the highest disability-associated health care spending, at $40.1 billion, and Wyoming had the lowest, at $598 million.

Eighteen percent of all adults reported having a disability, defined as having any limitation resulting from a physical, mental, or emotional problem, according to the study.

The disability-associated health care costs included the treatment costs for conditions such as traumatic brain injuries, strokes, and vision impairment and some treatment costs for chronic conditions such as diabetes and arthritis.

According to the research, the costs of health care for people with disabilities are borne largely by the public sector, particularly Medicaid; 68 percent of the program's spending was associated with disability. Approximately 38 percent of all Medicare spending was associated with disability, as was 12 percent of health care costs for those who had private insurance or who were uninsured.

The findings suggest that disability-associated health care spending may be reduced by encouraging use of preventive care services such as smoking cessation and mammograms, by health improvement interventions such as nutritional improvement programs, and most importantly by improving access to acute medical care for people with disabilities.

Senior health policy researcher Wayne Anderson, PhD, found that more than one-quarter of U.S. adult health care spending in 2006 was associated with disability.

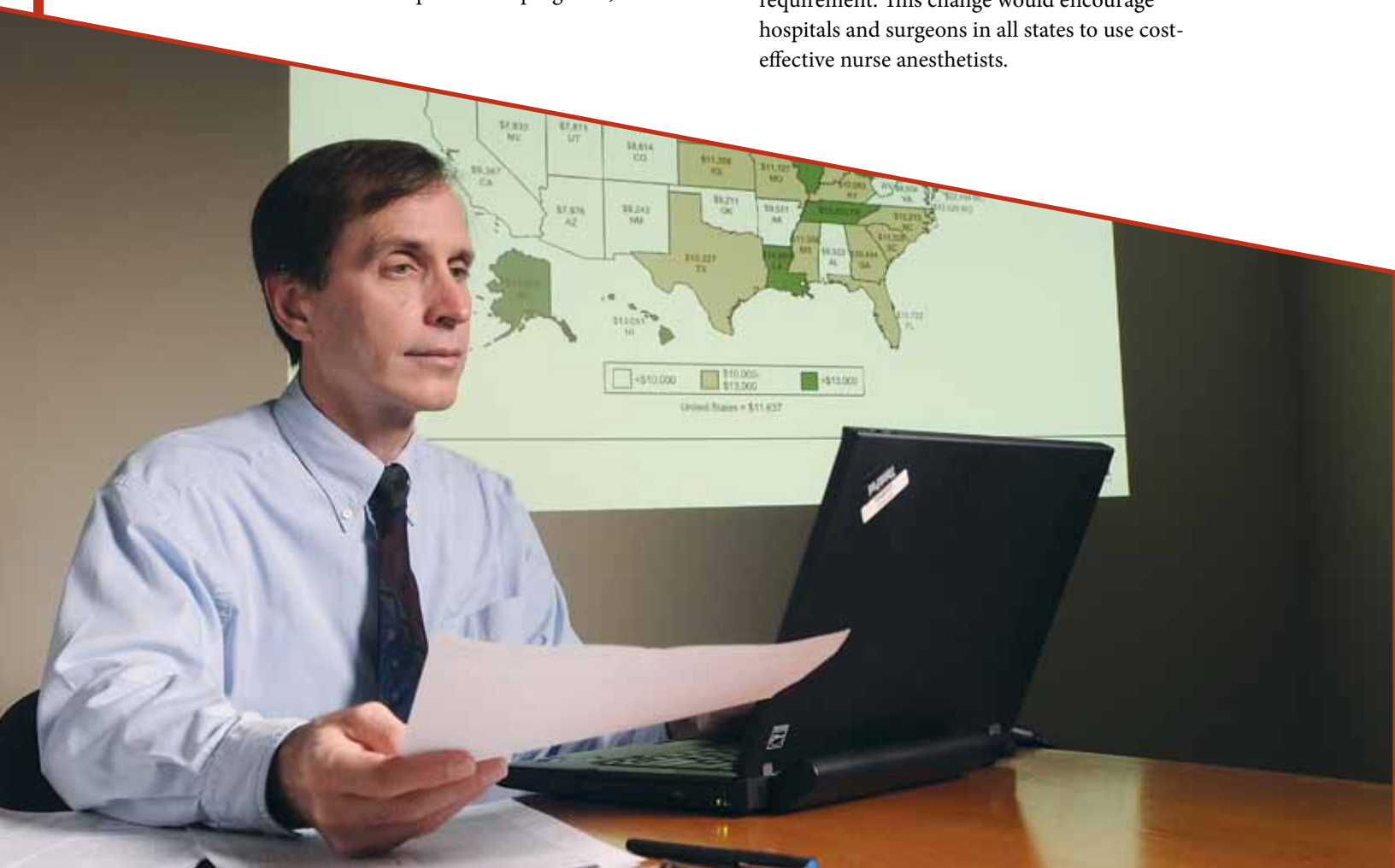
Questioning Medicare Requirements

During FY2010, our researchers, led by Jerry Cromwell, PhD, questioned the federal Medicare requirement that nurse anesthetists be supervised by an anesthesiologist or surgeon in order to receive Medicare reimbursement, and the findings of their study were published in the August issue of *Health Affairs*.

The findings indicated that allowing nurse anesthetists to provide anesthesia services without supervision from a doctor does not put patients at increased risk.

Presently, states can opt out of the supervising doctor requirement, but only if the governor petitions the Centers for Medicare and Medicaid Services (CMS).

Based on the research findings, our researchers recommend that CMS change the policy so that governors no longer have to petition for their states to opt out of this Medicare requirement. This change would encourage hospitals and surgeons in all states to use cost-effective nurse anesthetists.



To assess the possible impacts in states that opt out, our researchers analyzed 481,440 hospitalizations covered by Medicare, comparing patient outcomes across three scenarios: certified registered nurse anesthetists (CRNAs) working alone in the operating room without anesthesiologist supervision, anesthesiologists working alone, or the nurse anesthetist and anesthesiologist working together on a case.

Our findings showed no significant difference in patient outcomes across the three groups. Our researchers addressed complexity differences by controlling for gender, age, race, and high-mortality cases. They also weighted anesthesiologist cases to conform to the typical CRNA case mix.

The authors contend that CRNAs receive high-level training and can provide the same required level of service as anesthesiologists at potentially lower cost.

Understanding Low Rates of Colorectal Cancer Screening

High out-of-pocket costs, lack of health insurance, and limited access to care contribute to a relatively low rate of colorectal cancer screening in the United States, according to research conducted by researchers at the RTI International–University of North Carolina at Chapel Hill Evidence-Based Practice Center and published in the April 13, 2010, issue of *Annals of Internal Medicine*.

Funded by the Agency for Healthcare Research and Quality, the research, led by RTI's Debra Holden, PhD, consisted of a systematic review of more than 100 studies concerning the use and quality of appropriate colorectal cancer screening conducted in the United States between 1998 and 2009.

The findings showed that low household income, lack of health insurance, and not having a regular provider or not being informed by a physician or health care provider of the need for colorectal cancer screening were among the major reasons people did not get screened.

We found that access to care is not the only issue. After patients have access to care, they need a simple and reliable mechanism through which to interact with their physicians and others in the health care system to understand the need for screening and the pros and cons of each type of screening strategy.

The results also showed that improving referral systems and designating someone to help patients navigate the health care system increased colorectal cancer screening rates.

Sending reminders to patients also led to small to moderate increases in colorectal cancer screening.

Health Information Technology

During FY2010, we formed the Center for the Advancement of Health Information Technology to support the adoption and effective use of health information technology. Our researchers are working to facilitate the electronic management of health information and its secure exchange between health care providers, public health agencies, and consumers by identifying optimal ways to use electronic health records (EHRs), personal health records, and other forms of health information technology to improve the safety and quality of health care in the United States and around the world.

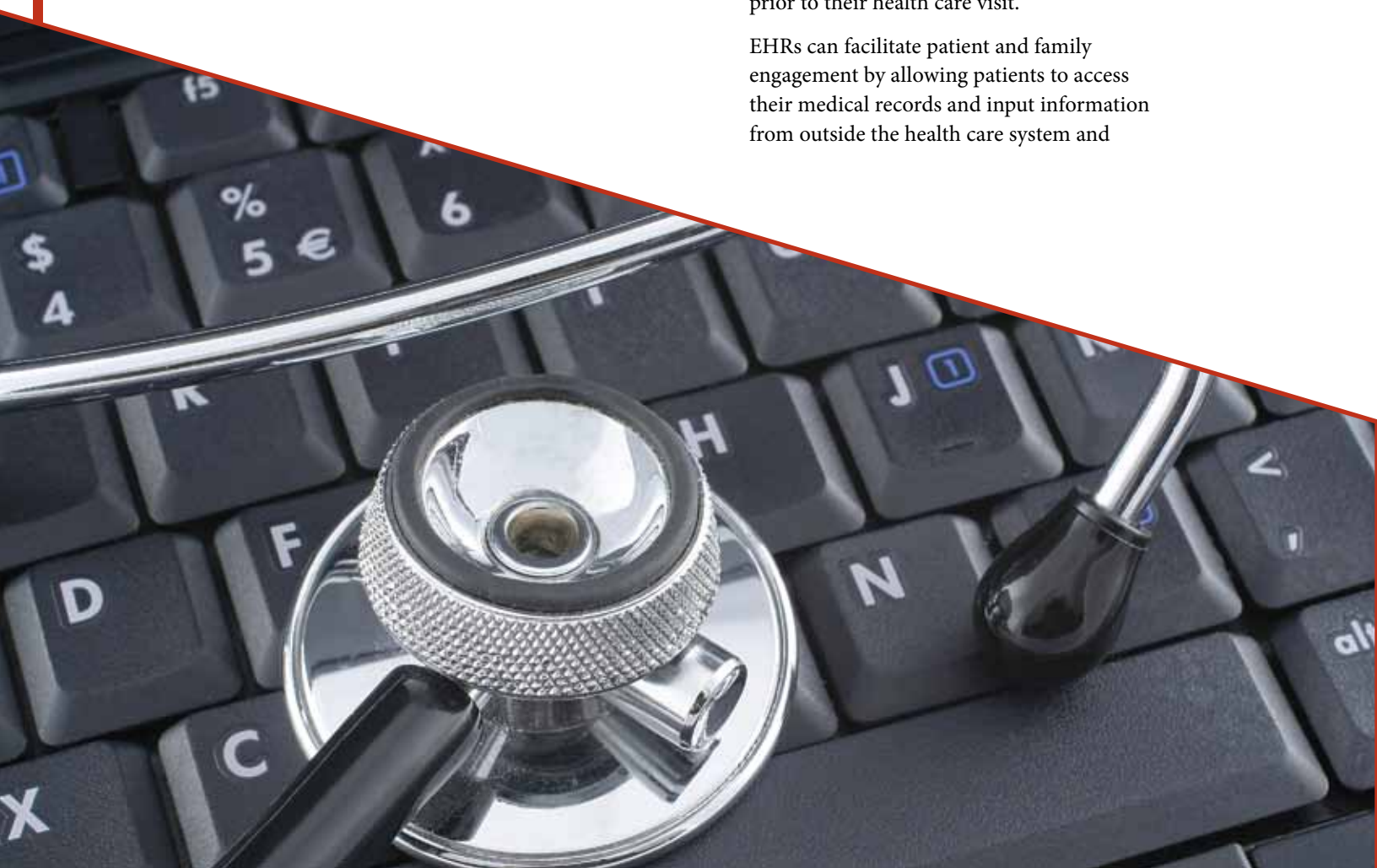
Integrating Electronic Health Records into Medical Practices

During FY2010, researchers at RTI began working on several projects to support a national program that will help more than 100,000 primary care providers begin integrating EHRs into their practices.

As part of one project, our researchers will identify key factors in successfully implementing EHRs at these practices and will then work to disseminate the findings. RTI will develop toolkits to help primary care practices assess, plan, and evaluate their implementation efforts. RTI will also develop programs and deliver training to help providers redesign their workflows to successfully incorporate the systems.

Additionally, our researchers will develop new patient and family engagement tools, resources, and best practices to help patients and clinicians make the most of limited consultation time by, for example, helping patients access relevant health information and think about their concerns and questions prior to their health care visit.

EHRs can facilitate patient and family engagement by allowing patients to access their medical records and input information from outside the health care system and



RTI experts collaborate with a broad range of stakeholders to inform public policy about health information sharing practices and technologies.

by providing health information and tools to facilitate collaborative decision making and self-management.

EHRs will also provide physicians with the tools and resources they need to measure the quality of the care they deliver. Rather than relying on insurance billing information, they will be able to use actual test results, assessments, and patient outcomes to improve patient health.

As part of our efforts, RTI will also be coordinating two learning communities composed of early adopter provider practices drawn from around the country. These communities seek to advance their practice of patient and family engagement for meaningful use, as a source for innovation in future patient and family engagement tools and resources.

Building Personal Health Record Applications

As part of a new, innovative grant from the Robert Wood Johnson Foundation, researchers at RTI and Virginia Commonwealth University began developing a personal health record application for smartphones that will help physicians and patients monitor the daily routine of people with asthma, and thus improve treatment.

As part of the two-year grant, the team, led by RTI's Barbara Massoudi, PhD, is developing a personal health record application for smartphones that will allow asthmatic patients to track lung function, medication use, levels and types of physical activity, activity limitations, air pollution, airborne allergens, smoking, and other quality-of-life measures. Thirty to fifty patients will then be given a smartphone to record their daily activities through patient self-reporting and the application's biomonitors.

Clinicians will be able to use a Web-based dashboard (Microsoft HealthVault) to quickly view their patients' data and communicate any changes in treatment or monitoring.

"New technologies are allowing for the creation of personal health record applications that will enable our health care system to now provide more patient-centered care," said Massoudi. "With the technologies we're developing, patients and clinicians will be able to communicate more quickly and easily and more accurately track environmental and behavioral effects on our health."

The researchers will use Microsoft HealthVault to store patient data and will develop the personal health record application using the open-source Android platform for mobile devices.

Using Wireless Technology to Enable More Responsive Health Care Systems in the Philippines

During FY2010, RTI adapted a locally developed electronic medical records system and tested the use of 3G wireless technology to enable rural health units in Tarlac Province, the Philippines, to transmit public health status and services data to the provincial health office.

The technology saves health care workers hours of manually tallying and completing paper-based reports and speeds the transmission of information.

If scaled up, the system has the potential to improve overall accuracy and timeliness of health data from public health clinics that will help the Philippines government identify and prevent disease outbreaks and make informed decisions about the allocation of health resources based on data.

The pilot phase recorded more than 12,000 patient consultations and has been very successful in the pilot rural health units in Gerona, Moncada, Paniqui, and Victoria.

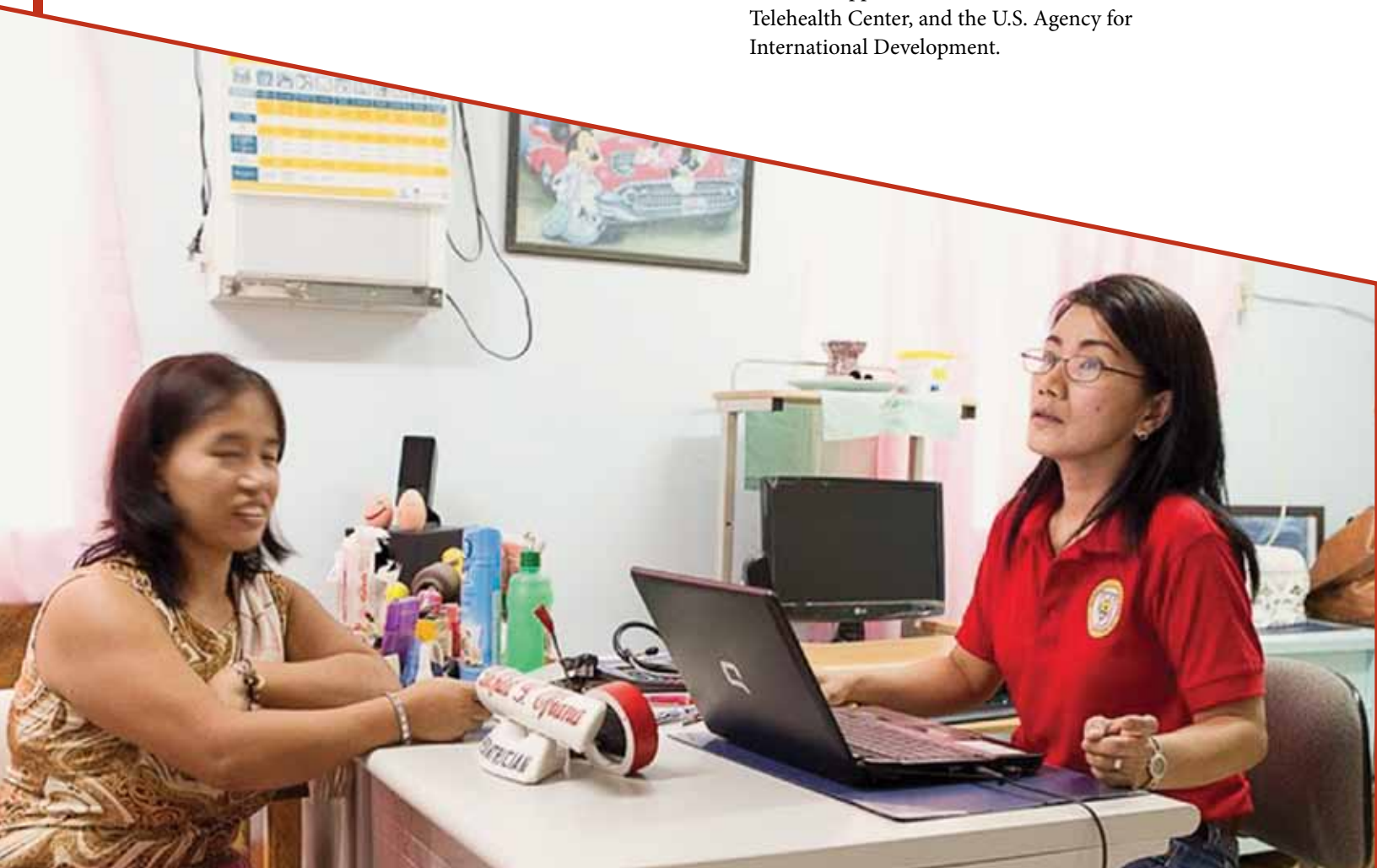
Pilot phase results indicate that the system improves patient care in rural health clinics and provides valuable information for various decision makers, such as midwives, doctors, and policy makers.

Our researchers led project strategy, planning, and implementation and oversaw software development, testing, and training programs in collaboration with the project partners.

The program is now actively scaling up to new health facilities in Tarlac Province and beyond where local governments are willing to contribute their own resources toward the initial investments in equipment and training that are required to use the electronic medical record system.

RTI conducted the project in partnership with Qualcomm Incorporated, the Philippines Department of Health, Tarlac Provincial Health Office, Smart Communications, Tarlac State University, the University of the Philippines Manila National Telehealth Center, and the U.S. Agency for International Development.

Our researchers adapted medical technology in the Philippines that has the potential to help the Philippines government identify and prevent disease outbreaks and allocate health resources.



Improving the Delivery of Substance Abuse Treatment Through Web-Based Data Systems

Underlying many of our successful projects are advanced computing systems that enable the collection, reporting, and analysis of data that are critical to service delivery in public programs. One example is the Services Accountability Improvement System (SAIS), maintained by RTI on behalf of SAMHSA.

SAMHSA's Center for Substance Abuse Treatment (CSAT) funds more than 600 discretionary grantees—state agencies, hospitals, treatment centers, and other organizations that provide substance abuse treatment. These grantees are required to report on key indicators of their performance, such as how many patients they take in, treat, and follow up with, and the outcomes that follow treatment.

Capturing that information and making the data accessible for reporting and analysis requires a robust and user-friendly system, as well as training in its use. SAIS enables grantee organizations to input their performance data and provides reports for use by SAMHSA, the grantees themselves, and independent evaluators studying substance abuse treatment in the United States. In addition, the SAIS team generates quick-turnaround analyses for CSAT that are used by policy makers throughout the federal government.

Since assuming responsibility for SAIS in 2008, RTI has added a number of enhancements, including graphical dashboard indicators for key performance targets. The dashboard reports let managers easily track their program's status and compare their performance with that of similar programs. We also developed online, on-demand courses and informational packets to train grantee organizations to make use of SAIS data and reports, enabling them to improve their performance.

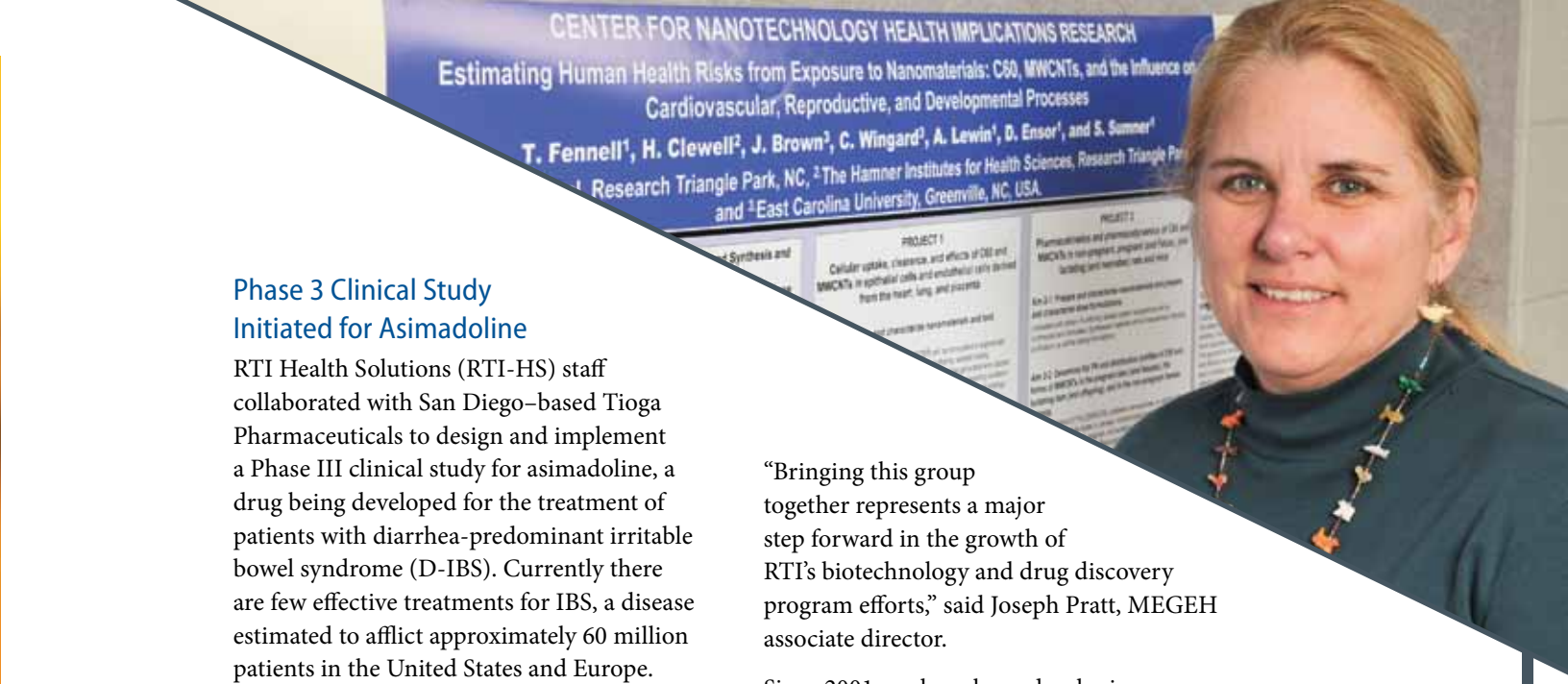
Currently, we are working to extend the dashboard to allow users to build and save custom reports. Our ultimate goal is to provide data interoperability—enabling the exchange of SAIS data with that of other federal datasets and with future systems for maintaining electronic health records.

Associate project director Scott Novak, PhD, reviews SAIS dashboard reports developed by RTI. These show on one page multiple key indicators of a program's performance.

pioneering new ways to
treat disease

Drug Discovery and Development

The search for new and better drugs and disease therapies has been one of RTI International's core research activities for decades. This year, we invested in our capabilities to identify promising new therapies, conduct pharmacovigilance, manage clinical trials, and further scientific progress toward personalized medicine.



Susan Sumner, PhD, leads MEGEH's signature program in obesity research. The new center conducts translational research to study disease, wellness, and susceptibility.

Phase 3 Clinical Study Initiated for Asimadoline

RTI Health Solutions (RTI-HS) staff collaborated with San Diego–based Tioga Pharmaceuticals to design and implement a Phase III clinical study for asimadoline, a drug being developed for the treatment of patients with diarrhea-predominant irritable bowel syndrome (D-IBS). Currently there are few effective treatments for IBS, a disease estimated to afflict approximately 60 million patients in the United States and Europe. If successful in clinical trials, asimadoline will help address a significant unmet medical need.

As part of our support, we developed the study protocol and are implementing and managing all aspects of the Phase III randomized multicenter clinical study.

In June 2010, Tioga announced that the first patient was enrolled and was participating in the study. The study will enroll 600 patients at 150 sites in the United States. RTI-HS will also conduct analyses of the clinical data.

Under the leadership of Lynne Hamm, the RTI-HS Clinical and Medical Services group added new staff and capacity to meet Tioga's needs and those of our other clients.

Making Personalized Medicine a Reality

In an effort to accelerate research to understand the complex relationships between genetics, genomics, and molecular epidemiology and their interactions with environmental factors, we committed more than $2 million this year to form a new multidisciplinary research center. The Molecular Epidemiology, Genomics, Environment, and Health (MEGEH) Center studies significant questions regarding genetics and human health through interdisciplinary and translational research.

"Bringing this group together represents a major step forward in the growth of RTI's biotechnology and drug discovery program efforts," said Joseph Pratt, MEGEH associate director.

Since 2001, we have been developing advanced capabilities in mass spectrometry, metabolomics, bioinformatics, biostatistics, and high-performance computing. MEGEH brings experts in these fields together in a team science approach to better define states of disease and wellness and to study susceptibility to disorders and disease. Working together, these RTI researchers will develop medical and public health interventions and policies that will promote implementation of personalized and preventive medicine.

Toward this end, in June 2010 we hosted a symposium for nearly 200 scientists, medical professionals, and biotechnology business leaders who gathered to discuss opportunities and realities in the emerging field of personalized medicine. One of the key topics discussed was a new concept gaining momentum called "P4 medicine," which seeks to guide medical practice in the direction of wellness by becoming *predictive*, *preventive*, *personalized*, and *participatory* for each individual.

Research within MEGEH is well under way. In September, we were awarded a contract by the National Institutes of Health to study the effect of physiological states on the distribution of nanoparticles. One long-term goal of this effort is to inform the development of drugs to treat co-morbidities of obesity.

In other efforts, Susan Sumner, PhD, who leads MEGEH's signature program in obesity research, is investigating the use of the urinary metabolome to monitor children's exercise and nutrition programs and is researching the biochemical effects of exposure in utero and during early development to chemicals termed "obeseogens."

Obesity research within MEGEH applies a systems biology approach to reveal psychosocial, biochemical, and molecular signatures of obesity and related health conditions.

Expanded Capabilities in Drug Discovery

As a nonprofit corporation, RTI routinely reinvests profits to grow our ability to fulfill our mission. This year, we made a substantial investment in our capabilities to assemble compound libraries and rapidly screen them in bioassays to discover new lead drug compounds.

"Disease states are often associated with a deficit or enhancement of cellular processes," explained Hernán Navarro, PhD, director of Discovery Sciences. "These malfunctions can be improved by drugs that selectively target receptors known to modulate the processes of interest."

RTI has the molecular biological and pharmacological capability to clone target receptors and incorporate them into functional in vitro assays. Our medicinal chemists use these assays to discover new molecules that influence the function of those receptors and, thus, have therapeutic potential. With the acquisition this year of a high-throughput screening device, we can now take full advantage of our assay development capabilities.

This year, we also expanded our expertise in cheminformatics and computational chemistry, enabling us to take a compound that shows desired receptor activity, search large databases of chemical structures for similar molecules, and compile a select library of compounds that might show the same activity.

These expanded capabilities are a tremendous asset for accelerating lead drug discovery in our existing research on addiction treatment and other central nervous system disorders,

Elizabeth Butala, PhD, prepares a sample for screening in the FLIPR Tetra system. Expanded capabilities in assay development and screening are accelerating lead drug discovery at RTI.

liver fibrosis, and obesity. Having the capability to develop and evaluate molecules that can probe the biological function of novel receptors greatly enhances our probability of identifying novel treatments for disease.

Novel Compound Receives FDA Approval

Driving all our work in drug discovery and development is the desire to improve human lives through new and improved therapies. This year RTI saw ulipristal acetate—a compound discovered in the 1990s by a team including the late C. Edgar Cook, PhD—receive approval from the U.S. Food and Drug Administration for use as a prescription-only emergency contraceptive. Under the brand name ella, the drug will help to address an unmet medical need in the field of women's and reproductive health.

Approved for use throughout the European Union under the brand name ellaOne since 2009, ella significantly and safely reduces the risk of pregnancy in women up to five days after unprotected intercourse or contraceptive failure. HRA Pharma, a privately held company that engineers drugs, devices, and services in reproductive health and endocrinology and makes them available worldwide, is responsible for the development of ella.

Also known as CDB-2914, ulipristal acetate was originally synthesized by RTI under contract with the National Institute of Child Health and Human Development (NICHD). NICHD carried out the initial preclinical and clinical development of the compound until 2000, when HRA Pharma licensed the molecule from RTI and took over its development.

A novel compound that interacts with the receptor of the hormone progesterone, ulipristal acetate has shown therapeutic potential for other conditions. In June 2010, Phase III trials indicated that that the compound is an effective treatment for symptomatic uterine fibroids, which affect nearly 50 percent of women over the age of 40. The drug is also being evaluated as a method of regular contraception as well as for the treatment of endometriosis, breast cancer, and other benign and malignant gynecological disorders.

Originally synthesized by RTI in the 1990s, ulipristal acetate was approved by the FDA in 2010. ella and ellaOne are registered trademarks of HRA Pharma.

measuring educational performance and improving student outcomes

Education and Training Research

RTI International experts conduct rigorous studies and programs to help improve educational opportunities for children and adults in the United States and many other countries. In FY2010 we undertook large-scale surveys examining the impact of financial aid and math achievement on education and career opportunities, hit a major milestone in a study of factors influencing the completion of postsecondary degrees, and made progress toward improving teaching and curricula in Senegal and Samoa.

Improving Education Quality in Senegal

In Senegal many students finish primary school without acquiring the basic literacy and numeracy skills they need to succeed in middle and high school. Compounding this problem, middle school teachers are often not adequately equipped to address these deficits.

With funding from the U.S. Agency for International Development, RTI is leading a project to address the learning needs of adolescents in several innovative ways. Led by chief of party Isabel Dillener and researchers Joseph DeStefano and Alison Pflepsen, we are working to improve and decentralize the training of middle school teachers, including helping the Ministry of Education set up regional teacher training centers and helping establish a framework for certification and professional development of teachers and principals that is based on performance standards.

To strengthen teachers' pedagogical and subject matter skills in French and math, the RTI team is developing in-service training programs. Targeted assessments of basic skills, sequenced lesson plans, and supplemental learning materials will enable teachers to identify and address the literacy and numeracy weaknesses among students performing at multiple levels. RTI also works with middle schools using a "whole school" approach to ensure that communities, parents, and students are able to both contribute to school improvements and hold schools accountable for performance.

To address the needs of out-of-school youth, we are working with the International Youth Foundation and Making Cents International to pilot programs in life skills and employability for middle-school-aged adolescents in eight regions of Senegal.

Integrating Technology to Bolster Science and Math Instruction in Samoa

While Samoa has the highest adult literacy rate in the Pacific region and near-universal access to primary and secondary education, disparities in education between urban and rural areas remain a challenge.

With funding from the Asian Development Bank, RTI and our partner Education Services Australia are helping the government of Samoa improve the quality of secondary education by increasing access to professional development opportunities, communication and information-sharing tools, teaching and learning resources, and better-equipped classrooms and facilities.

Project director Carmen Strigel explained, "Our team is tasked with building capacity within the Ministry of Education, Sports, and Culture."

We will advise the Ministry on developing electronic teaching and learning resources, as well as on training administrators and teachers in methods that integrate pedagogy with technology to sustain learning outcomes in science and math.

In this first year of the project, we completed a comprehensive baseline analysis of Samoa's secondary schools—interviewing principals, teachers, students, and community members—and put together a strategy for integrating information and communication technologies (ICT) into the Ministry's strategic plan, objectives, and policies.

We are training teachers and helping communities contribute to improved performance in Senegalese middle schools.

Over the next three years, we will work to extend the benefits of ICT to some 200 teachers and 5,000 students in 38 schools throughout the country.

We will work to strengthen education administration through the use of ICT for tracking and communication of school information, financial management, and school improvement planning. We will also explore options for public-private partnerships to ensure the financial sustainability of project investments and assist the Ministry with efforts to engage communities.

Assessing Impacts of Math Achievement on College and Career Choices

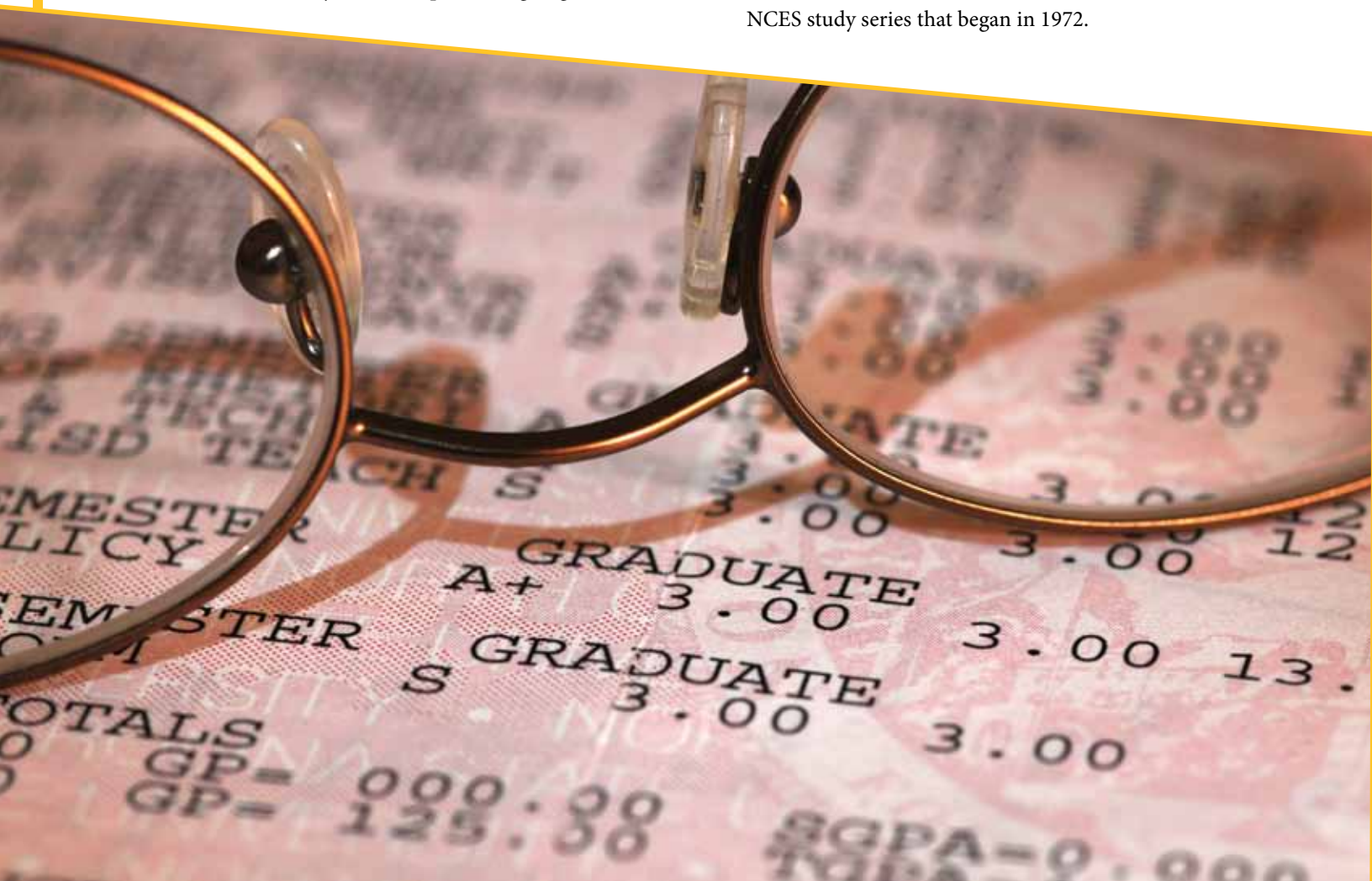
In June 2010, RTI was awarded a contract to continue tracking the achievement of more than 21,000 students in more than 900 schools across the United States.

Funded by the National Center for Education Statistics (NCES) and led by project director Daniel Pratt, the High School Longitudinal Study of 2009 is part of ongoing efforts to assess achievement in math and its effects on curricular and career choices. Of particular interest is student access to and use of curricula in science, technology, engineering, and mathematics.

In FY2010, we surveyed a cohort of 9th grade students and assessed their math skills; we also surveyed students' parents, school administrators and counselors, and math and science teachers. All data collection, including the in-school student assessments, used computer-assisted survey technology, primarily Web-based self-administration.

NCES plans to follow this student cohort until they reach age 26. Under the new contract, RTI will follow up with the students during their 11th grade year, again surveying administrators, counselors, students, and parents, as well as tracking dropouts and transfer students. Subsequent rounds will take place when the cohort begins the transition to college and the workforce and will include the collection of high school transcripts.

This new award will maintain our role in an NCES study series that began in 1972.



Informing Research and Policy on Postsecondary Education and Financial Aid

This year, we reached a significant milestone in the Beginning Postsecondary Students Longitudinal Study (BPS), whose goals are to identify factors that support student efforts to complete degree programs and to answer other questions of interest to U.S. policy makers.

"RTI has conducted BPS three times since 1990, collecting data about students in all types of postsecondary programs," said project director Jennifer Wine, PhD.

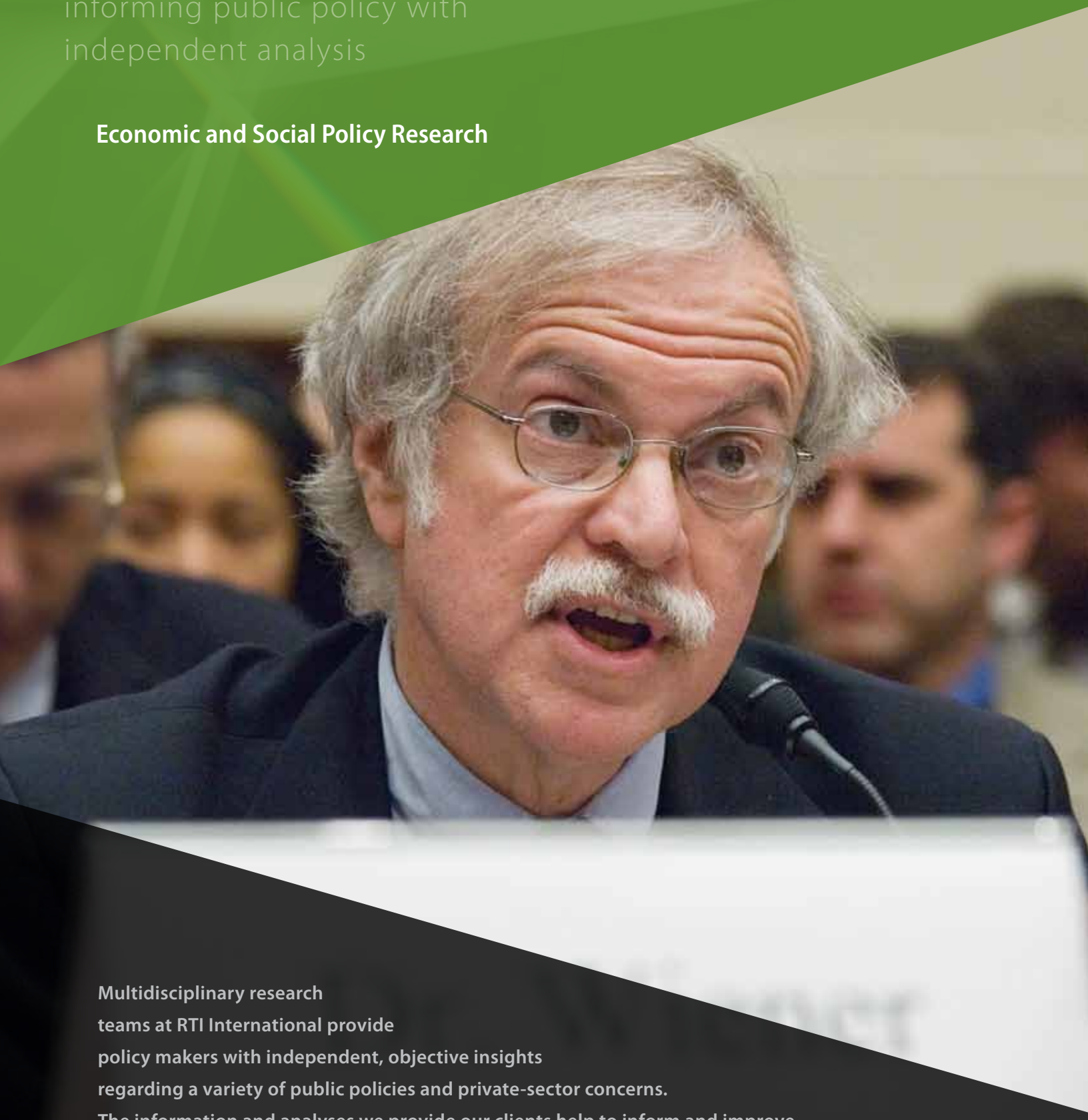
Information gathered includes degree completion and transition to employment, as well as changes over time in students' goals, marital status, income, and debt. This year, for the first time in the history of the study, we collected transcripts for more than 18,500 students in the cohort.

In all, RTI gathered more than 25,000 transcripts and uniformly coded the information in a database for use in future research efforts. Using this information, we are preparing a report for NCES that outlines the effect of students' ability to transfer course credits on the time, cost, and likelihood of degree completion.

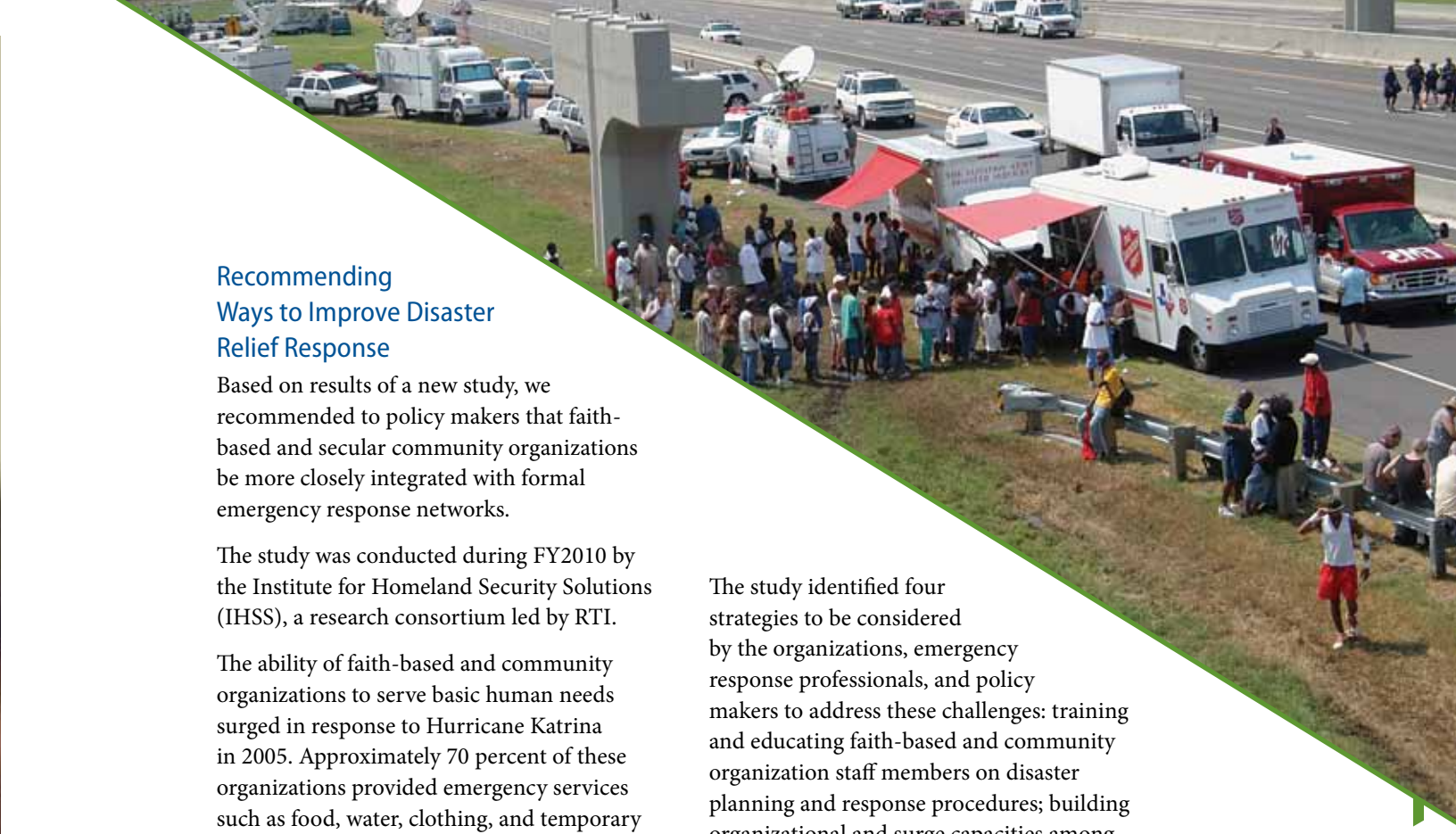
FY2010 also marked the continuation of our leadership of the National Postsecondary Student Aid Study, the only periodic, nationally representative survey of student financial aid. In October 2009, we were awarded a new 10-year contract to collect information on more than 120,000 students in the United States and Puerto Rico. The end result will be a public-use dataset designed to help researchers and policy makers better understand the affordability of college and the effectiveness of financial aid programs. RTI has conducted this study since 1996.

informing public policy with
independent analysis

Economic and Social Policy Research



Multidisciplinary research teams at RTI International provide policy makers with independent, objective insights regarding a variety of public policies and private-sector concerns. The information and analyses we provide our clients help to inform and improve public policy discourse and advance economic and social development decision making.



Recommending Ways to Improve Disaster Relief Response

Based on results of a new study, we recommended to policy makers that faith-based and secular community organizations be more closely integrated with formal emergency response networks.

The study was conducted during FY2010 by the Institute for Homeland Security Solutions (IHSS), a research consortium led by RTI.

The ability of faith-based and community organizations to serve basic human needs surged in response to Hurricane Katrina in 2005. Approximately 70 percent of these organizations provided emergency services such as food, water, clothing, and temporary shelter in the aftermath of the hurricane, even though two-thirds of the organizations had no prior experience in providing disaster relief.

In some communities, these were the only organizations providing aid. For example, Shiloh Missionary Baptist Church in Baton Rouge, Louisiana, a congregation of 3,500, housed more than 80 evacuees for an extended period in the aftermath of the hurricane, offering food, clothes, medical care, transportation, and childcare services.

But despite these successes, these organizations are often challenged in providing aid because they are not fully connected to the formal emergency planning process and response network.

The study identified four strategies to be considered by the organizations, emergency response professionals, and policy makers to address these challenges: training and educating faith-based and community organization staff members on disaster planning and response procedures; building organizational and surge capacities among these organizations; improving coordination and planning between local organizations and state and local government agencies; and developing information management systems to help track organizations, volunteers, clients, and resources.

The study was sponsored by the Office of Faith-Based and Community Initiatives and the Department of Homeland Security's Human Factors/ Behavioral Science Division.

Raising Awareness About Forensic Evidence Procedures

During FY2010, RTI researchers, led by Kevin Strom, PhD, worked with the National Institute of Justice and found that over a five-year period, 14 percent of open homicide cases and 18 percent of open rape cases in the United States contained forensic evidence that had not been sent to a crime lab for analysis.

Senior researcher Kevin Strom, PhD, led a study that found that over a five-year period, 14 percent of open homicide cases and 18 percent of open rape cases in the United States contained forensic evidence that had not been sent to a crime lab for analysis.

Approximately 40 percent of these unanalyzed homicide and rape cases were reported to have contained DNA evidence.

The study, which surveyed more than 3,000 state and local police departments, also found that evidence retention policies and practices in U.S. police departments vary widely. Less than half of U.S. police departments reported having a policy for preserving biological evidence from cases in which a defendant was convicted. Furthermore, fewer than half of police departments (43 percent) reported having computerized systems in place for tracking forensic evidence inventory.

In part because of the awareness the study raised, the San Antonio Police Department changed its policy and is now testing all rape kits in stranger cases and is going back to test all untested stranger rape kits in storage.

Other police departments are also revising their procedures for submitting and analyzing forensic evidence associated with rape cases.

The survey showed that among the reasons cited for not submitting forensic evidence for analysis were as follows:

- 44 percent of law enforcement agencies reported that evidence is not submitted for analysis unless a suspect has been identified
- 15 percent reported that they may not submit forensic evidence to a laboratory if the analysis was not requested by a prosecutor
- 11 percent said they did not submit evidence because they felt the laboratory was not able to produce timely results.

Results from this study were published in *Criminology & Public Policy* and will also appear in a forthcoming special edition of the *Journal of Contemporary Criminal Justice*, which will be devoted to forensic science.

Sharing Our Research Findings with Congress

In June 2010, Pamela Lattimore, PhD, a principal scientist at RTI, reported findings from her team's evaluation of the Serious and Violent Offender Reentry Initiative to the U.S. House Judiciary Committee.

She told these policy makers that inmates leaving prison who participated in the initiative had better outcomes in employment, housing, and health than did newly released inmates who did not participate in the program.

Lattimore and her team evaluated the Serious and Violent Offender Reentry Initiative, which provided three-year grants to 69 state agencies in 2003 and 2004 to develop and implement prisoner reentry programs.

The Serious and Violent Offender Reentry Initiative was the first of recent federal efforts to provide corrections and juvenile justice agencies with funding to develop and implement programs designed to promote successful community reintegration of inmates and juvenile detainees following their release.

The evaluation, conducted in partnership with the Urban Institute, looked at 12 adult reentry programs and 4 juvenile reentry programs in 14 states. The researchers interviewed nearly 2,500 men, women, and boys between July 2004 and April 2007.

Lattimore reported that inmates who participated in the program were 10 percent more likely than those not in the program to support themselves with a job three months following their release. Participants were also more likely to have a job that was permanent, that offered formal pay, and that had benefits such as health insurance and vacation pay.

However, Lattimore said that the findings suggest that Congress and other funders should expect that an effort extending beyond three years may be necessary to develop, implement, and sustain reentry programs to meet the employment, housing, and treatment needs of prisoners being released.

Pamela Lattimore, PhD, told the U.S. House Judiciary Committee that inmates leaving prison who participated in the Serious and Violent Offender Reentry Initiative had better outcomes in employment, housing, and health.

helping developing and transitional countries
with science-based best practices

International Development

With more than 200 staff members based around the world, RTI International supported projects in more than 40 countries in FY2010. Our experts apply proven analytical tools and methods and, more importantly, transfer these tools and expertise to in-country organizations and government leaders. This year, we highlight efforts in Africa, the Middle East, and Asia.

Strengthening Local Governance in Iraq and Nigeria

This year, RTI reached milestones in two countries where we are leading efforts funded by the U.S. Agency for International Development (USAID) to build the capacity of local government to meet the needs of citizens.

In Iraq we are in the third phase of efforts begun in 2003. This phase focuses on helping elected officials perform four basic functions of governance: legislating, planning, budgeting, and monitoring.

Our advisors worked to resolve some of the uncertainty in a legal environment in which the relationship between provincial and central government is still undefined. To help provincial councils and governors' offices prepare budgets, we developed a nine-step process and manual. We provided similar assistance regarding feasibility studies required for all capital projects requested by provincial councils. As a result of these efforts, 10 provincial councils submitted capital projects and all 15 provinces completed operational budgets on time.

Our project team also coordinated a citizen satisfaction survey regarding water and waste water services, marking the first use of a random sampling survey to identify shortcomings in the delivery of basic services in Iraq. We helped provincial councils establish calendars and committees necessary to produce responsive, enforceable local legislation and organized a national conference to encourage further clarification of the authority of provincial governments.

In Nigeria, we are implementing USAID's Leadership, Empowerment, Advocacy, and Development (LEAD) project. Under this effort, RTI is working with communities in two northern Nigerian states to increase citizen involvement and improve public services. These communities have committed to testing new approaches and spreading best practices to their counterparts across Nigeria.

In its first year, LEAD focused on assessing budgeting processes and water policies, adapting tools to the Nigerian context, and establishing working groups that will lead efforts to improve local government performance. Our advisors led a participatory process to prioritize improvements in community service, and we organized town hall meetings and other opportunities for local leaders to reach out to constituents. These meetings have rekindled the spirit of civic engagement, providing a platform for community mobilization and citizen participation.

Early efforts by our experts in local governance strengthening have rekindled the spirit of civic engagement in two Nigerian states.

Collaborating to Improve Urban Sanitation in Indonesian Communities

In Indonesia's urban areas, less than 40 percent of the population have access to clean drinking water, and less than 25 percent have access to improved sanitation. To help address these challenges, Taiwan, one of the largest foreign investors in Indonesia, is funding a collaborative project led by RTI and launched in May 2010.

In collaboration with the Environmental Quality Protection Foundation of Taiwan and an Indonesian nongovernmental organization known as BEST, we are implementing a

small project to address urban sanitation conditions in one subdistrict in Tangerang, Banten Province.

Building upon BEST's strong track record of sanitation programming, the program will facilitate community-based planning and targeted infrastructure improvements in Tangerang, an industrial and manufacturing hub in Java. Tangerang has a large population of urban migrant workers who live in densely populated areas with poor water and sanitation.

In early efforts, the team launched a hygiene and cleanliness campaign with local government support. Elements of the campaign include teaching the health benefits of hand-washing to elementary students and families, as well as a community-led effort to encourage an end to the practice of open defecation.

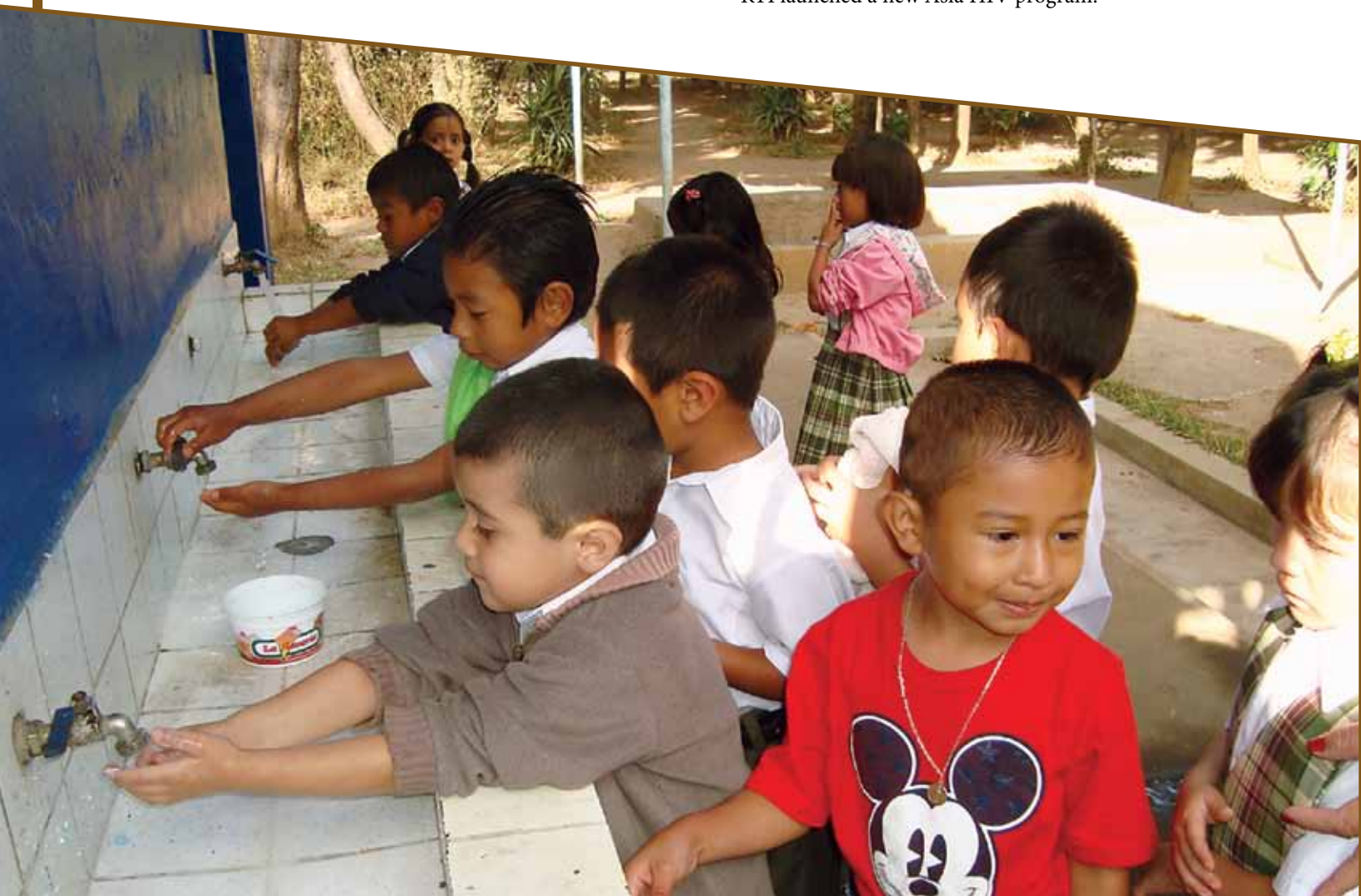
"By encouraging behavior change and improving facilities and systems at the neighborhood level, while also linking closely with local leadership," said project director Myles Elledge, "we aim to effect real improvement and establish a community-school model that enables broader application beyond this one community where we will initially focus our efforts."

New Asia Program Reaches Out to Those Most at Risk for HIV

In Asia and elsewhere, the HIV epidemic is concentrated within most-at-risk populations (MARPs)—sex workers and their clients, men who have sex with men (MSM), and injecting drug users. Ensuring access to prevention, care, support, and treatment services is critical to halting the HIV epidemic among these groups and in the general population.

In January 2010, with the aim of developing innovative, effective, and comprehensive approaches to reach these at-risk populations, RTI launched a new Asia HIV program.

To improve urban sanitation in Tangerang, we are employing the school community as an agent for promoting good hygiene practices.



Anchored in Bangkok and directed by Harry Cross, PhD, the program is working to strengthen the leadership and advocacy role of MARP communities. Our approach applies RTI's considerable expertise in research and policy analysis to address human rights, legal issues, gender issues, and reduction of stigma and discrimination.

Among other activities, the program has hosted seminars on key issues in HIV prevention among MARPs, including one in Bangkok on MSM and transgender people, and one in Washington, DC, on the U.S. government's revised guidelines for preventing HIV transmission among injecting drug users.

With $3 million in RTI investment funding, the program builds on our experience in health systems strengthening and HIV prevention among MARPs in China, Indonesia, the Philippines, Georgia, Botswana, and Madagascar.

For example, in the Greater Mekong Region and China, we are leading USAID's Health Policy Initiative, which works to strengthen the policy environment, improve the quality of and access to legal and health services for MARPs, and reduce stigma and discrimination. This year, we helped consolidate the work of the HIV Legal Aid Center in Kunming, expanding its services, and helped build capacity among Kunming legal professionals on HIV issues. The center delivered legal advice to more than 100 clients, extended outreach to more than 8,000 people, trained local community organizations on the legal rights of people living with HIV, and trained more than 100 lawyers on topics related to HIV law.

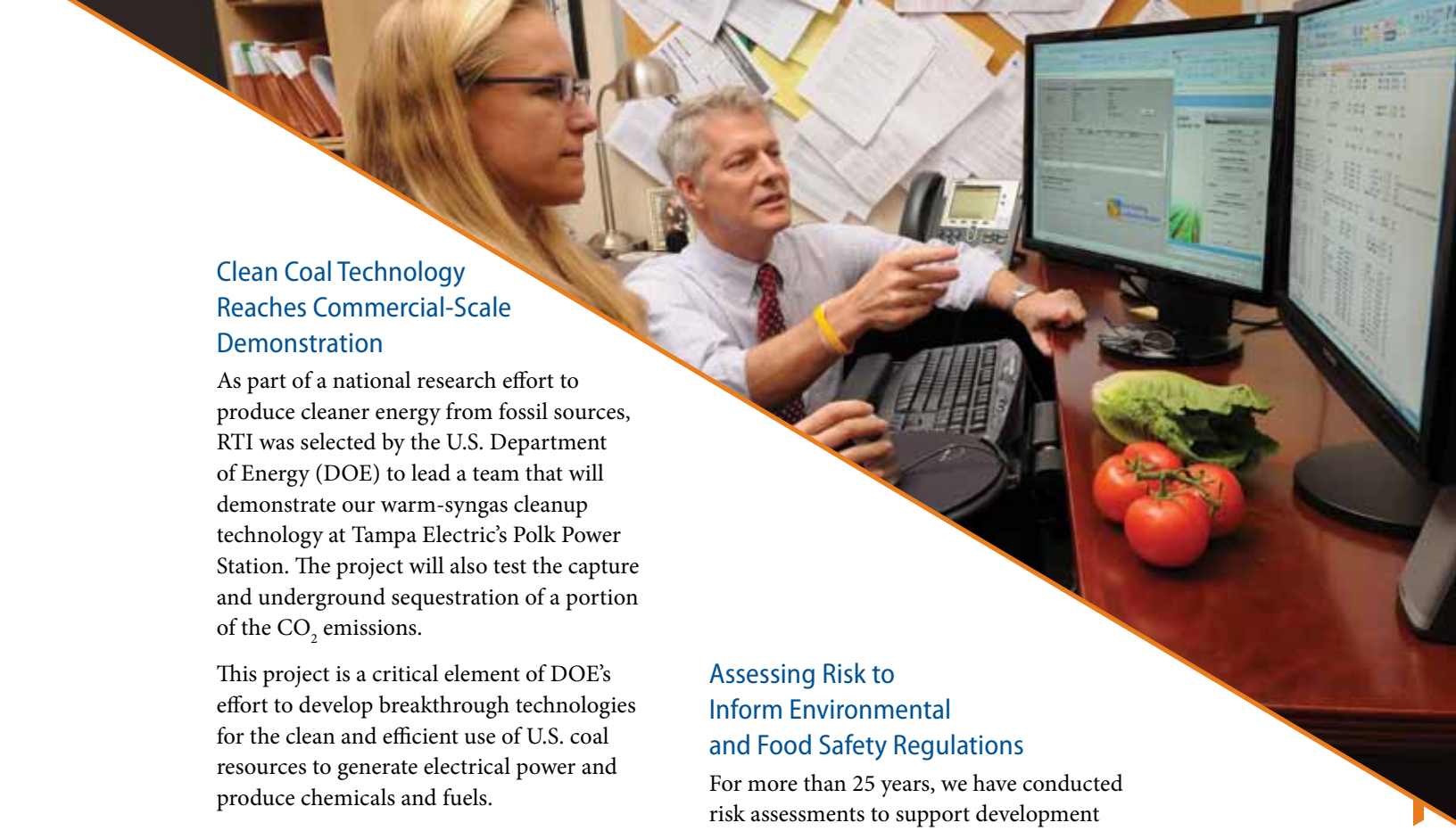
Through projects like this and new efforts under the Asia HIV program, we aim to play a greater role in the effort to blunt the HIV epidemic in Asia.

Our new Asia HIV program builds on our global experience in health systems strengthening and HIV prevention among most-at-risk populations.

applying scientific solutions to
environmental challenges

Energy and Environmental Science

In the laboratory and in the field, RTI International researchers work every day to assess, protect, and restore our environment. This year we highlight our efforts to apply fundamental breakthroughs in science to the commercial adaptation of clean coal technology, assess environmental and food safety risks, and monitor air pollution in remote areas.



Clean Coal Technology Reaches Commercial-Scale Demonstration

As part of a national research effort to produce cleaner energy from fossil sources, RTI was selected by the U.S. Department of Energy (DOE) to lead a team that will demonstrate our warm-syngas cleanup technology at Tampa Electric's Polk Power Station. The project will also test the capture and underground sequestration of a portion of the CO_2 emissions.

This project is a critical element of DOE's effort to develop breakthrough technologies for the clean and efficient use of U.S. coal resources to generate electrical power and produce chemicals and fuels.

Sited in Florida, this 50-megawatt scale project brings RTI together with several industry partners: Tampa Electric, The Shaw Group Inc., BASF Corporation, Süd-Chemie Inc., and Eastman Chemical Company. Funding for the project is being provided through the American Recovery and Reinvestment Act of 2009.

The gasification process converts carbon-based materials such as coal and biomass into syngas, which requires cleanup and conditioning steps before being used for power generation. Our technology removes contaminants such as sulfur and heavy metals at high temperatures, eliminating the need for syngas cooling and expensive heat recovery systems. This increases the efficiency of the power plant by as much as 10 percent and reduces the capital and operating costs when compared to conventional technology.

Cost-effective syngas cleanup technology is also key to achieving near-zero emissions from gasification-based chemical plants, for which RTI's technology is well suited.

Assessing Risk to Inform Environmental and Food Safety Regulations

For more than 25 years, we have conducted risk assessments to support development of science-based regulations to protect the environment and human health. Led by director Stephen Beaulieu, our risk assessment program combines expertise in environmental science, statistics, ecology, modeling, toxicology, and other fields to predict and characterize risks from exposure to chemical and biological contaminants in the environment.

Projects completed this year illustrate the range of clients and risk management objectives that our work supports.

On behalf of the U.S. Environmental Protection Agency, we completed a number of studies, including a comparison of risks associated with methods for disposing of solvent-contaminated rags and wipes used to clean industrial equipment, a risk-benefit assessment of regulatory options under consideration for underground gasoline storage tanks, and a characterization of risks associated with pollutants in biosolids that are applied to agricultural lands as a soil amendment.

Stephen Beaulieu and Maren Anderson, PhD, review a "farm to fork" risk characterization tool we developed to support FDA studies of strategies to reduce contamination in the food supply chain.

In support of the U.S. Food and Drug Administration (FDA), RTI developed a comprehensive database of more than 50 food commodities and the chemical and microbial hazards they can carry. The database will help FDA prioritize its efforts to reduce the risk of foodborne illness. It also supports a "farm to fork" risk characterization tool we developed to assist FDA studies of strategies to reduce contamination in the food supply chain.

As with most of our risk models and data, our researchers developed these tools as open-source applications, enabling FDA to disseminate and use them to inform future regulatory decisions. Our emphasis is on developing practical solutions that support science-based decisions to reduce or mitigate potential risks to health and the environment.

Our risk assessment experience extends to international clients. During the past year, we completed a prototype system that will be used by the Environment Agency in Abu Dhabi (EAD) to characterize potential risks associated with industrial facility operations and chemical waste management. Dubbed RiCHES (Risk Characterization and Hazard Evaluation System), the system collects and analyzes information on chemical usage and process hazards. Developed in collaboration with EAD staff, this tool will enable users to identify the riskiest industrial sectors, facilities, processes, and chemicals, which will ultimately inform the development of risk reduction strategies in Abu Dhabi.

New Methods for Measuring Air Pollution

In FY2010, we began work on a project supported by the University of Minnesota and the Wood Buffalo Environmental Association of Alberta, Canada, to investigate novel ways to monitor pollution in remote locations.

In areas without access to electric power, typical air sampling methods—which rely on large pumps, filters, sorbent beds, and other equipment to measure polynuclear

Our risk assessment experts helped the Environment Agency in Abu Dhabi develop a system to characterize risks from industrial and chemical waste operations.

aromatic hydrocarbons (PAHs) and other pollutants—are impractical. In addition, standard methods collect samples over short time frames, one to two days, providing only a snapshot of air pollution. A better understanding of the potential environmental impacts of pollution hinges on gathering data about seasonal and longer-term pollutant concentrations and trends.

RTI's research study in Alberta is attempting to address these needs by investigating the potential of plants to absorb PAHs and reflect pollution concentrations over longer periods of time.

Applying our experience in the analysis of trace-level organics in biological materials, we have developed and characterized a method for measuring PAHs in lichens. Using this method, we determined the PAH content of lichens from 20 locations in Alberta and, working with researchers at the U.S. Environmental Protection Agency, determined that PAH concentrations in plants can be used to measure environmental accumulation of pollutants to help characterize source strength and to provide insight into ecological exposures.

However, despite this demonstrated utility, lichens present some challenges, particularly related to sample collection.

"It is difficult to get sufficient quantities of a single species of lichen that are free from bark and other debris," explained James Raymer, PhD, principal investigator for the study. "Also, lichens have a variable and sporadic growth rate, leading to uncertainties when extrapolating PAH concentrations in lichens to PAHs concentrations in air."

As the study progresses, we will examine other biological materials such as pine needles that have the potential to reduce such uncertainties and provide a clearer understanding of PAH concentrations present in air over multiple growing seasons. These data should provide a stronger basis for ecological risk analysis.

Jocelin Deese-Spruill studies plant samples to determine whether they can be used to monitor air quality in remote locations.

harnessing science to transform the world

Advanced Technology

RTI International engineers are committed to helping clients identify, develop, apply, and transfer leading-edge technologies. This year, our highlights include exciting developments in the scientific pursuit of clean fuels and energy-efficient lighting, as well as a new effort to help the Kingdom of Saudi Arabia build a knowledge economy.

Radical Engineering for Clean, Domestic Fuels

RTI has long been committed to applying our expertise in chemical and process engineering to develop and improve clean energy technologies. In FY2010, we expanded this work under two efforts that have the potential to reduce the demand for imported petroleum and reduce greenhouse gas emissions.

Under a project funded by the Department of Energy's Advanced Research Projects Agency–Energy, our engineers are developing a process that could enable the United States to replace fossil fuels with domestically produced biofuels.

With partners at Archer Daniels Midland Company (ADM) and ConocoPhillips, we are developing a new method for catalytic pyrolysis that could convert second-generation biomass into a bio-oil. Similar to petroleum crude, the resulting bio-oil could be upgraded into liquid fuels using existing processes at U.S. refineries. The refined fuel could be stored, pumped, and used exactly as petroleum-based fuels are today.

Under the leadership of project manager David Dayton, PhD, we have successfully validated the catalytic pyrolysis concept in a microreactor test system and begun developing new procedures for screening catalysts. ConocoPhillips is applying its expertise in fuel qualification to analyze biocrude samples and is working with ADM to develop process models that will demonstrate the cost-effectiveness of this novel technology and evaluate optimum scenarios for commercial deployment.

Collaborative Science in Pursuit of Solar Fuels

In the latest joint effort with our founding universities—Duke University, North Carolina State University (NCSU), and the University of North Carolina at Chapel Hill (UNC)—RTI formed a new research institute in 2010 focused on making liquid fuel directly from sunlight. Under the direction of Distinguished Fellow James Trainham, PhD, the Research Triangle Solar Fuels Institute (RTSFI) will develop enabling technologies necessary to make artificial photosynthesis a commercially viable method for producing liquid fuels.

The process of converting sunlight into liquid fuels involves fundamental questions in chemistry, physics, and materials science and poses significant engineering challenges.

RTSFI combines the extensive capabilities of all four partner institutions: modeling, nanoscale materials, and molecular assemblies at Duke; NCSU's programs in semiconductor and device integration; UNC's nationally recognized leadership in catalysis and dye-sensitized photoelectrochemical cells; and RTI's expertise in translational research—particularly in developing technologies to produce clean energy and fuels.

Early R&D efforts will focus on improving the efficiency and lifetime of photoelectrochemical cells and developing the infrastructure to support scale-up.

Our process engineers are developing green technologies that could reduce the demand for imported petroleum.

Ultimately, RTSFI seeks to apply the full weight of its collective scientific, engineering, and commercialization expertise to develop full-scale photoelectrochemical devices and designs for commercial liquid fuel plants.

Efficient Lighting Through Nanofiber Technology

In one of our most exciting achievements this year, RTI developed a revolutionary lighting technology that is more energy efficient than the common incandescent light bulb.

At the core of our breakthrough, funded in part by the Department of Energy's Solid-State Lighting program, is an advanced nanofiber structure that provides exceptional light management.

By devising a method to control the nanoscale properties of materials, we can create high-performance, nanofiber-based reflectors and photoluminescent nanofibers. Combined, these two nanoscale technologies enable a lighting device that is more than five times as efficient as traditional incandescent bulbs.

"Because lighting consumes almost one-fourth of all electricity generated in the United States, our technology could have a significant impact in reducing energy consumption and carbon dioxide emissions," said Lynn Davis, PhD, director of RTI's Nanoscale Materials program.

RTI's technology produces an aesthetically pleasing light and does not contain mercury, which makes it more environmentally friendly and safer to handle than compact fluorescent light bulbs.

Looking ahead, we will continue to develop this technology and to pursue commercialization opportunities. We anticipate that products containing our breakthrough will be available in three to five years.

Helping Saudi Arabia Build a Knowledge Economy

In January 2010, RTI experts in technology transfer and open innovation began work with King Abdullah University of Science and Technology (KAUST) to help build its capabilities in technology transfer and commercialization.

Polymer engineer Karmann Mills works with nanoscale materials that are part of our revolutionary technology for energy-efficient lighting.

Dan Winfield brings expertise in innovation-led economic development to help KAUST and Saudi Arabia build a knowledge economy.

Founded by the Kingdom of Saudi Arabia as part of an effort to build the nation's knowledge economy, the university has state-of-the-art equipment and facilities and has attracted international faculty, researchers, and students. KAUST conducts research and pursues technological innovations in areas of economic importance to the Kingdom such as clean energy, water desalination, computational bioscience, and plant stress genomics. RTI is assessing commercial applications for inventions arising from these and other research programs. For promising technologies, we also define industry requirements, market opportunities, commercial strategy, and paths for technological development.

"The Saudi economy is heavily based on oil exports, and Saudi companies have traditionally imported most of their technology through direct sales or foreign direct investment by large multinational corporations. Economic diversification is a priority for the Kingdom," explained RTI's Dan Winfield, director of Technology Applications.

Winfield is working with KAUST faculty to assess the research and innovation, entrepreneurship and business incubation, capital formation, and business climate in Saudi Arabia.

Compared to peer countries around the world, Saudi Arabia has traditionally invested less in R&D. The Kingdom also has lower levels of entrepreneurship and educational attainment, particularly in science and technology fields. With industrial collaboration, a research park and incubator, programs for technology commercialization, and seed funding, KAUST seeks innovative approaches to fill these gaps. Thus, the university itself is an excellent subject for research into the role a university can play in national and subnational economic development.

In the coming year, RTI and KAUST will work together to elucidate the challenges and opportunities associated with growing a viable knowledge economy in Saudi Arabia. We will also help develop a framework for assessing the nation's progress toward that goal. Additional research will seek to understand and address challenges to implementation of open innovation in Saudi Arabia. Through these and other efforts, we will apply our knowledge of best practices in innovation-led economic development to help KAUST exercise its full potential as leader of Saudi Arabia's new knowledge economy.

taking care of our people, our communities, and our environment

Corporate Information

RTI International's mission—to improve the human condition—also reflects our commitment to practicing responsible corporate citizenship and providing a healthy and productive environment for our staff members. We continue to support a wide variety of community-based social service organizations and scientific and educational outreach activities. This year, we launched a corporate initiative focused on environmental stewardship and sustainable business practices.

Living Our Mission

Supporting Our Communities

Through our community partnerships program, this year RTI contributed $143,000 to 93 charitable organizations that serve the communities where RTI staff live and work, including Atlanta, Chicago, the Research Triangle Park area, San Francisco, Waltham, the Washington, DC, area, South Africa, and the United Arab Emirates. We made a $10,000 corporate contribution to the International Federation of Red Cross and Red Crescent Societies in support of earthquake relief efforts in West Sumatra, Indonesia. We also matched staff donations to make a $150,000 contribution to American Red Cross earthquake relief efforts in Haiti.

Recognizing that continuing economic difficulties create increased demand for services, we rallied behind the United Way and exceeded previous years' efforts. We raised $381,000, which includes an RTI corporate donation to both the United Way of the Greater Triangle and the United Way of the Bay Area in San Francisco. For our extraordinary success, the United Way of the Greater Triangle presented RTI with the Chairman's Award. Staff members further demonstrated their support by participating in the annual Martin Luther King Jr. Day of Service, which provides opportunities to volunteer in support of local charitable organizations.

Our staff members undertook a variety of efforts to improve the lives of others. For example, more than 30 staff members supported the annual Expanding Your Horizons conference at North Carolina State University, an event to encourage girls to pursue careers in science, technology, engineering, and math. We also collected nearly 3,000 pounds of food and other items for the holiday drive to benefit the Food Bank of Central and Eastern North Carolina.

Great Place to Work

While staff members are working to improve the lives of people around the world, RTI is working to make the institute a great place to work. Our wellness program includes onsite exercise facilities and vaccinations and an onsite child care facility, among other resources. For the second consecutive year, we were named one of North Carolina's Family-Friendly 50 companies by *Carolina Parent* magazine for our dedication to helping employees balance work and family life.

We also earned the National Standard of Excellence in commuter benefits by Best Workplaces for Commuters, a distinction shared with only 11 other Triangle-area companies. Our commuter benefits include transit and vanpool subsidies, rideshare matching, preferred parking for carpools and vanpools, and secure bicycle parking.

Corporate Sustainability

As a leader in science and technology, RTI is committed to using scientific knowledge, technical expertise, and business acumen to implement sustainability practices and ensure environmental responsibility.

In the spring, President and CEO Victoria Franchetti Haynes joined more than 20 regional and national leaders to encourage North Carolina companies to adopt sustainable and socially responsible business practices. We issued our inaugural sustainability report, which makes public our longstanding commitment to environmental stewardship and sustainable practices and communicates our plans for continuous improvements.

The annual holiday food drive is one of many charitable efforts spearheaded by our staff every year.

Early initiatives include systems to minimize hazardous impacts, encourage reuse and recycling, and improve waste management. Water-saving equipment installed throughout our main campus has saved 2 million gallons of water since 2007.

In 2010, we started construction on the second building on RTI's main campus designed to meet the requirements of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED).

Awards and Recognition

Focusing on our mission and client needs has once again earned RTI a place on the *Triangle Business Journal's* annual Fast 50 Awards. The award recognizes the Triangle's 50 fastest growing private companies.

For the second year in a row, our enterprise risk management program was named a gold winner of the Alexander Hamilton Award for Enterprise Risk Management by *Treasury & Risk* magazine.

RTI and Nextreme Thermal Solutions, a spin-off of RTI, won a prestigious R&D 100 award for the development of a chip-scale thermoelectric cooler that can be used to provide a unique and effective solution for thermal problems of high-performance computer and electronic chips. Sponsored by *R&D Magazine*, the award honors the 100 most significant new technologies of the past year.

We encourage our employees to become involved in scientific and industry organizations to enhance their careers, and we create opportunities to bring their research, analytical tools, and technical expertise to national and international attention. This year, the RTI Press released 15 publications and added new categories, including books, monographs, research briefs, and policy briefs. Also, several of our staff members earned awards in recognition of their achievements.

Kathleen Lohr, PhD, RTI Press Editor-in-Chief, displays two of this year's 15 publications, available for free download at www.rti.org/rtipress.

NC Governor Beverly Perdue presented RTI Distinguished Fellow Ivy Carroll, PhD, with the prestigious North Carolina Award for Science.

Nichole Bynum

Forensic scientist Nichole Bynum was selected as one of three recipients of the Young Scientist Meeting Award from the Society of Forensic Toxicologists for her research into the comparative forensic validity of results obtained from two different mass spectrometry methods used to detect drugs in urine.

F. Ivy Carroll

RTI Distinguished Fellow F. Ivy Carroll, PhD, was recognized with the highest award given by the State of North Carolina, the North Carolina Award, for his groundbreaking research in biochemical addiction and drug abuse. Carroll was also honored this year by the National Institute on Drug Abuse as the third recipient of its Public Service Award for Significant Achievement. RTI celebrated Carroll's 50 years of research at RTI with a scientific symposium in his honor in November.

David Ensor

RTI Distinguished Fellow David Ensor, PhD, received a Meritorious Service Award by the American National Standards Institute (ANSI) in recognition of his contributions to ANSI and to the voluntary standardization community. Ensor was also honored with the Gene and Linda Voiland School of Chemical Engineering and Bioengineering Distinguished Alumnus Award at Washington State University.

R.K.M. Jayanty

RTI Senior Fellow R.K.M. Jayanty, PhD, received a Lifetime Achievement in Environmental Practice award from the Institute of Professional Environmental Practice. Jayanty was recognized for his impressive accomplishments, including research leading to rules and standards paramount to the protection of human health.

Charles Rodes

RTI Senior Fellow Charles Rhodes, PhD, was awarded the 2010 Environmental Sciences and Engineering Distinguished Alumni Award from the University of North Carolina at Chapel Hill (UNC). The award recognizes graduates of UNC's Environmental Sciences and Engineering Department who made outstanding professional achievements.

Dorota Temple

RTI Senior Fellow Dorota Temple, PhD, received the Institute of Electrical and Electronics Engineers' Region 3 Outstanding Engineer Award. The recipient is chosen from more than 30,000 members across 10 states.

Godfrey Woelk

Senior research epidemiologist Godfrey Woelk, PhD, was honored with BioMed Central's Fourth Annual Research Award. Woelk was recognized in the medicine category for a research paper on translating research into policy in developing countries.

Leadership

RTI is led by an experienced group of senior executives who represent a cross-section of our research fields and business operations. These leaders implement our business strategy and oversee operations for our global enterprise. They are accountable to RTI's president and board of governors, our primary governing body.

Board members, who represent the University of North Carolina campuses, Duke University, and the business and scientific communities, formulate policy that is consistent with our mission.

Senior Management

Victoria F. Haynes
President and Chief Executive Officer

James J. Gibson
Executive Vice President and
Chief Financial Officer

E. Wayne Holden
Executive Vice President, Social, Statistical, and Environmental Sciences

Jennie Hunter-Cevera
Executive Vice President, Discovery and Analytical Sciences, Government Affairs, and Corporate Development

Lon E. Maggart
Executive Vice President,
International Development

Allen W. Mangel
Executive Vice President, RTI Health Solutions

Martha Roberts
Unit Vice President and
Chief Human Resources Officer

Satinder K. Sethi
Executive Vice President, Operations

G. Edward Story
Senior Vice President, General Counsel, and Corporate Secretary

James A. Trainham
Vice President, Strategic Energy Initiatives

Board of Governors

Earl Johnson Jr. (Chairman)
Chairman, Southern Industrial Constructors, Inc.

Thomas F. Darden
President and Chief Executive Officer, Cherokee Investment Partners

Barbara Entwisle*
Interim Vice Chancellor, Research & Economic Development, University of North Carolina at Chapel Hill

Victoria F. Haynes
President and Chief Executive Officer, RTI International

Robert A. Ingram*
Partner, Hatteras Venture Partners; Former CEO, Glaxo Wellcome

Peter M. Lange
Provost, Duke University

Terri L. Lomax
Vice Chancellor for Research and Graduate Studies, North Carolina State University

Harold L. Martin
Chancellor, North Carolina A&T State University

John H. Moellering*
Chairman, USAA

William M. Moore Jr.**
Managing Partner, Lookout Capital

H. Troy Nagle
Professor, Joint Department of Biomedical Engineering, University of North Carolina at Chapel Hill and North Carolina State University

Hilda Pinnix-Ragland
Vice President Corporate Public Affairs, Progress Energy

Paul J. Rizzo***
Chairman of the Board and Partner, Franklin Street Partners

Peter M. Scott III****
President and CEO, Progress Energy Services Company; Former CFO, Progress Energy

James N. Siedow
Vice Provost for Research, Duke University

Phail Wynn Jr.
Vice President, Durham and Regional Affairs, Duke University

* Board Member as of November 2010
** Board Chair as of December 2010
*** Retired Board Member as of November 2010
**** Vice Board Chair as of December 2010

Financials

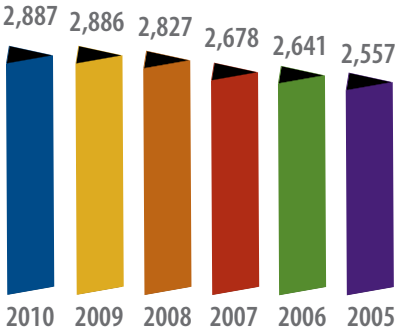
We enjoyed a successful business year, with annual revenue from contracts and grants totaling $759 million for the fiscal year ending September 30, 2010 (an increase of 5.7 percent over FY2009).

Our financial position and outlook remain strong, with equity increasing to $232 million as of September 30, 2010 (a 10.7 percent increase). Our net revenue (revenue after expenses) totaled $21.8 million. As a nonprofit corporation, RTI invests net revenue in facilities and infrastructure, programs, and capabilities to further our mission of conducting research that improves the human condition by turning knowledge into practice.

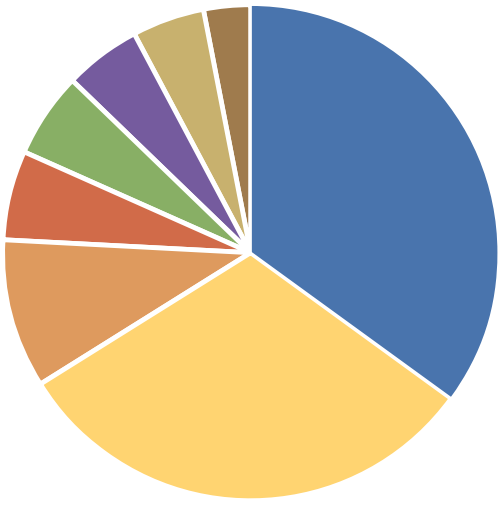
On February 11, 2010, RTI issued its $23.0 million series 2010 fixed-rate revenue bonds in the marketplace—our second issuance of tax-exempt debt. The security for the series 2010 bonds is a general obligation of RTI. Standard & Poor's Rating Services assigned its AA– long-term rating (high investment grade) to the series 2010 bonds based upon RTI's "robust record and long history as a prominent research institute with several key business lines, all of which are profitable." RTI will use the $23.0 million series 2010 proceeds to fund the construction and equipping of an approximately 120,000-square-foot new office building and related 500-space parking deck on RTI's main campus in Research Triangle Park. The construction project is scheduled for completion in March 2011.

For the Year	FY2010	FY2009
Revenue from research programs	$758,688	$717,917
Current assets	$297,864	$247,648
Property and equipment, net	$138,551	$116,234
Total assets	$441,858	$369,782
Current liabilities	$170,495	$146,122
Institute equity	$231,835	$209,410

Revenue (in millions)



Staff



FY2010 Revenue by Source (in millions)

Source	Percentage	Revenue
USAID	35%	$265.4
DHHS	31%	$236.6
Commercial	10%	$73.6
Other Non-Federal	6%	$44.9
Other Federal Agencies	5%	$41.7
Department of Defense	5%	$38.2
Department of Education	5%	$35.3
EPA	3%	$23.1
Total	100%	$758.7

Client List

U.S. Government Clients

Department of Agriculture
Department of Commerce
Department of Defense
Department of Education
Department of Energy
Department of Health and Human Services

- Administration for Children and Families
- Agency for Healthcare Research and Quality
- Centers for Disease Control and Prevention
- Centers for Medicare and Medicaid Services
- Food and Drug Administration
- Health Resources and Services Administration
- National Institutes of Health
- National Toxicology Program
- Office of the National Coordinator for Health Information Technology
- Office of Population Affairs
- Office of the Secretary
- Substance Abuse and Mental Health Services Administration

Department of Homeland Security
Department of Housing and Urban Development
Department of the Interior
Department of Justice
Department of Labor
Department of State
Department of Transportation
Environmental Protection Agency
National Aeronautics and Space Administration
National Science Foundation
U.S. Agency for International Development

Private-Sector Clients

Abbott Laboratories
Amgen
Arkema
AstraZeneca
BASF SE, Intermediates Division
Bayer Yakuhin, Ltd.
Biogen Idec
Boehringer Ingelheim
Bristol-Myers Squibb Co.
Chevron Corporation
Cisco Systems
Dow Chemical
DRS Technologies
DuPont
Eli Lilly and Company
GE Healthcare
GlaxoSmithKline
Golden Pacific Laboratories, LLC
The Hamner Institutes
The Johnson & Johnson Family of Companies
Johnson Matthey
KBR
Lockheed Martin
MedImmune
Medtronics
Merck & Co., Inc.
The Nielsen Company
Novartis
Novo Nordisk
Ogawa & Co. USA
Pfizer
PhRMA
Qualcomm
Roche
Sanofi-Aventis
Shell
Shire
Takeda Pharmaceuticals UK
Talecris Biotherapeutics
Talisman Environmental Services, Inc.
Teva Neuroscience
Tioga Pharmaceuticals
U.S. News & World Report

Other Clients

Abu Dhabi Executive Affairs Authority
American Heart Association
AIHA Proficiency Analytical Testing Programs, LLC
American Legacy Foundation
ASHRAE
Bill & Melinda Gates Foundation
Ford Foundation
Global Alliance for TB Drug Development
Hewlett Foundation
International Partnership for Microbicides
Ministry of Foreign Affairs of the Republic of China (Taiwan)
National Multiple Sclerosis Society
Robert Wood Johnson Foundation
Royal Military College of Canada
Smith Family Foundation
Spencer Foundation
U.K. Department for International Development
U.S. state governments
The World Bank
World Health Organization

RTI International is one of the world's leading research institutes, dedicated to improving the human condition by turning knowledge into practice. Our staff of more than 2,800 provides research and technical expertise to governments and businesses in more than 40 countries in the areas of health and pharmaceuticals, education and training, surveys and statistics, advanced technology, international development, economic and social policy, energy and the environment, and laboratory and chemistry services. For more information, visit www.rti.org.

RTI INTERNATIONAL

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