At the end of each year, we reflect on how RAND research and analysis have helped those we hope to serve. Our mission demands that we tackle the right problems, transcend intense partisanship, provide evidence and insight that inform policy debates, and—ultimately—enable leaders to make decisions that improve lives.

Our criteria for defining success must be as rigorous as our standards for research. The projects highlighted in this annual Year in Review meet a three-tier test for impact, with each tier posing a tougher challenge:

**TIER 1**

The research and analysis address issues at or near the top of the policy agenda or help shape that agenda.

**TIER 2**

The results reach key decisionmakers and the broader public, improving the quality of policy discussions and debate.

**TIER 3**

The findings and recommendations lead directly to improvements in policy and decisionmaking.

In this Year in Review, it is my honor to share with you examples of RAND research and analysis being put to use to make individuals, communities, and nations safer and more secure, healthier and more prosperous.

Achievements such as these underscore the utility of rigorous, objective research and analysis and the payoffs of sustained investments in RAND by clients, grantors, and donors. Thank you for your interest in RAND, in our mission, and the impact we achieve.

Michael D. Rich

President and CEO
Touching Lives

In 2018, RAND research made direct and meaningful contributions to improving health, education, and prosperity for individuals and communities throughout the world, including through the examples highlighted here.

A Master Plan for Puerto Rico

When Hurricane Maria crashed into Puerto Rico in September 2017, the island had already suffered through a decade of economic crisis. That December, with Congress about to give the governor of Puerto Rico 180 days to submit a recovery plan, the Federal Emergency Management Agency (FEMA) asked the Homeland Security Operational Analysis Center (HSOAC) to provide analytic support. RAND operates HSOAC for the U.S. Department of Homeland Security. Disaster relief is typically reactive, but FEMA wanted a new approach: a strategic vision for a better future for Puerto Rico and the more than 3 million people who live there, as well as a comprehensive recovery plan—grounded in rigorous evidence—to get there. HSOAC’s team developed new methods to assess damage and needs, gathered hundreds of data sources, analyzed options for recovery, and presented options for the governor’s decision. The researchers calculated recovery costs to be $139 billion, identified potential funding sources, and created a decisionmaking support tool that helped the governor and his team make informed choices.

The governor’s final plan was delivered to Congress on time on August 8, 2018. The Financial Oversight and Management Board certified the plan just 20 days later—a credit to HSOAC’s rigorous, independent research. The plan is now the basis of Puerto Rico’s recovery efforts. HSOAC is engaged in a multiyear follow-on effort to perform economic analysis and validate cost estimates for what will be about 500 recovery projects.

Expanding Summer Learning

During summers away from school, low-income students fall further behind their more-affluent classmates. Since 2010, RAND has been studying the design and efficacy of summer learning programs aimed at reversing this backward slide. In 2011, researchers began a four-year study of voluntary summer learning programs that combined academic instruction and enrichment for low-income students in five districts in the United States, including Boston. The study used a randomized controlled trial to compare outcomes for students who attended summer learning programs and those who did not. Researchers found that students with high summer attendance returned to school in the fall with stronger foundations in math, language arts, and social and emotional skills, and the academic benefits persisted throughout the school year.

In 2018, on the strength of these findings, the Massachusetts state legislature appropriated funds for summer learning programs based on the study’s model, which Boston Public Schools had already adopted. RAND also updated its manual on how to set up and sustain effective summer programs, a manual that is being used across the United States. Meanwhile, RAND researchers have mapped summer learning deserts in Pittsburgh to help philanthropists and educators place programs where they are most needed.

Jobs for Ex-Offenders

One in four American adults have a criminal record, and about 20 million have a felony conviction that can make it hard to find employment, despite labor shortages. Although there are many programs to help formerly incarcerated people, the research is sparse on what it takes for employers to hire such candidates. RAND launched a pair of studies to explore these challenges via RAND Ventures, a program for investing in important but underappreciated policy issues that is made possible by unrestricted gifts from philanthropic supporters.

One study experimented with various incentives to learn which were most likely to make employers consider hiring ex-offenders. The two most valuable were validating
work performance history and promising to send a replacement worker to the employer if the hire is not suitable. A second study reviewed efforts by the Career Training Partnership of Sacramento to provide employment services to people on probation. The Career Training Partnership adopted several of RAND’s recommendations. Its programming now includes on-site drug treatment services, and its leaders are pursuing funding to offer a stipend to participants for basic expenses while attending the program. These leaders are also taking steps to enhance the program’s ability to track participant outcomes. Also, responding to the researchers’ recommendation to develop training more explicitly targeted to the unique needs of female probationers, the New Jersey Probation Department has partnered with RAND to develop and evaluate a job training program specifically for women.

**Legalizing Cannabis**

RAND research has long sought to help lawmakers and the public better understand the trade-offs involved in cannabis legalization. In 2018, Canada and the state of Vermont legalized cannabis. Each had consulted with RAND researchers for years about the consequences of different approaches, particularly how choices about production, prices, and the enforcement of regulations could affect health, public safety, and social equity.

Governments are becoming increasingly cautious about simply replacing prohibition with a for-profit, commercial cannabis market. Canada opted for a more restrictive middle-ground option that allows each province to regulate supply, and some jurisdictions created government-run cannabis stores. Vermont, the first U.S. state to legalize cannabis by legislation instead of referendum, permits only home growing and personal possession. The approaches of each jurisdiction, while different, reflect in their details the careful balancing of numerous factors outlined in RAND research to minimize harms and unintended consequences.

Researchers are now helping Washington state understand the dynamics of its market for cannabis, where prices have plummeted since legalization by referendum in 2012. And RAND was selected to be part of a team to conduct analyses for the New York governor’s working group to draft legislation to permit regulated adult use.

Meanwhile, a RAND study that followed more than 6,500 adolescents in Southern California for seven years found that exposure to medical marijuana advertising made teens more likely to use. Los Angeles County asked a RAND researcher for help drafting a new ordinance aimed at limiting child and adolescent exposure to cannabis advertising. The city council approved the ordinance, which went into effect in July 2018.

**Helping the Military Reduce Sexual Assault and Suicide**

The U.S. Air Force is requiring that all its bases adopt evidence-based programs aimed at reducing sexual assault, suicide, and other violence. It mandated that bases incorporate an approach called Getting To Outcomes® into the action plans that each base produces to address community concerns. RAND and the University of South Carolina created and have been developing Getting To Outcomes since 2004. It is a process proven to help communities plan, implement, and evaluate intervention programs and has been successfully used in a variety of settings, including the prevention of substance misuse, teen pregnancy, and underage drinking.

In 2018, RAND researchers taught the Air Force the Getting To Outcomes process for use in preventing violence and increasing resilience. Using a train-the-trainers approach, they trained more than 300 Air Force personnel, representing nearly all installations worldwide. Researchers provided guides describing the Getting To Outcomes process as applied to suicide, sexual harassment, sleep, and stress. They continue biweekly consultations with community support program
managers at the major commands to assist them in developing high-quality prevention plans.

This approach to sexual assault prevention is now being extended to the other military services by the U.S. Department of Defense’s Sexual Assault Prevention and Response Office (SAPRO). RAND researchers are currently supporting these efforts by training SAPRO and other military service personnel in the key steps and techniques of Getting To Outcomes.

The Power of Facts

One enduring value of RAND research is in establishing and verifying facts—whether they proved welcome or unwelcome, provided new insights, or confirmed untested assumptions. Here are examples of projects that yielded results so clear and compelling that decision-makers took note—and then took action.

Gun Policy in America

Gun policy research to date has not been sufficiently rigorous to clarify contested issues. This was the conclusion of another project launched by RAND Ventures, our philanthropic investment program, with the proceeds of its fundraising program. The initiative analyzed thousands of studies to examine the quality of the evidence on the effects of different gun policies—to show what outcomes are known, what is unproven, and where new information could help build consensus about how to improve U.S. gun policies.

The first report from the study garnered nearly 800 media mentions within a month, making it one of RAND’s most-covered studies. Leaders of scientific organizations took notice and publicly called for more research on gun policy, including a commentary in Science coauthored by leaders of the two most important U.S. scientific organizations, the American Association for the Advancement of Science and the U.S. National Academy of Medicine.

The Arnold Foundation responded to the call for funders to fill gaps left by federal underinvestment in firearm research. The foundation is now enabling additional RAND research on gun policy and has engaged RAND to help evaluate and administer up to $50 million in grants that the National Collaborative on Gun Violence Research will award for scientific research on gun policy over the next five years.

On Capitol Hill, RAND staff discussed federal support for research on gun violence, and Congress has already passed legislation that tracks with two recommendations. Senator John Cornyn won bipartisan support to improve the FBI’s background check system, citing the RAND study from the Senate floor. Congress also accepted RAND's advice to enhance the National Violent Death Reporting System, which could illuminate the circumstances surrounding gun deaths.

What Doesn’t Work in Education Reform

Sometimes RAND research has impact by disproving assumptions or revealing what doesn’t work and why. Such was the case after RAND published an evaluation of a $575 million program, designed by the Bill & Melinda Gates Foundation, to improve student outcomes by improving teaching. Teachers are known to be critical to student success, so the program made specific goals:

- Change the way teachers are recruited, develop rigorous measures of effective teaching, evaluate teachers more thoroughly, provide customized professional development tied to their evaluation, incentivize successful teachers to work in low-income schools, and encourage underperforming teachers to leave the profession.

RAND researchers assessed the program in seven locations and found that it did not achieve its goals. Most teachers did not become more effective. Retention rates for excellent teachers did not rise, although ineffective teachers were more likely to leave teaching. The RAND study identified multiple factors that might have caused this null finding. Based on the study and other feedback, the Gates Foundation has shifted gears and is now focusing on building networks to help schools scale up methods that are proven to work.
Coping with Climate Change

RAND research has been using advanced modeling to help communities cope with the uncertainties of climate change. Projects include helping Louisiana protect its eroding coastline, Pittsburgh manage its stormwater, Miami-Dade County plan for rising sea levels, and Broward County mitigate flooding and the intrusion of saltwater into drinking-water wells. In 2018, researchers showed that climate change not only threatens coastal development but would also harm inland areas where groundwater is shallow and increased rainfall patterns could cause flooding. Heavy rainfalls later in the year produced flooding in precisely the areas the model had predicted. In Broward County alone, $18 billion in assets are at risk, but the research indicated ways that risk could be mitigated. RAND research prompted an update in the maps of groundwater flooding risk, and developers are now required to respond to the risks indicated on the new maps.

Investments in Supportive Housing

More than half a million Americans experience homelessness on any given night, and almost 10 percent of them live in Los Angeles County. They are more likely to have serious mental illness, chronic medical conditions, and substance use disorders, and many find themselves shuffling through a cycle of homelessness and incarceration. In 2014, a team of RAND researchers began evaluating the county’s Housing for Health program, which combines supportive services with a long-term housing subsidy. The findings were striking: The first 890 participants visited emergency rooms less, were hospitalized less, and cost the county nearly 60 percent less than the previous year; For every $1 invested in the program, the county saved $1.20.

The county increased the number of housing slots to 5,000 and expanded the program to serve more than 1,500 people in the criminal justice system. Private funders, along with federal agencies, agreed to underwrite the program. The Housing for Health study was cited in the official voter guide for the November 2018 election as supporting evidence for Proposition 2, which passed. Sacramento County, Riverside County, and Chicago cited the RAND study as they began their own housing programs. RAND researchers have been asked to evaluate similar initiatives elsewhere in California and in Arizona.

Strengthening National Security

In the 17 years since 9/11, the United States has focused above all on the struggle against terrorism. However, the 2017 National Defense Strategy declared that the priority would change to countering a resurgent Russia and China. In 2018, RAND research both informed this policy shift and helped implement it in many ways. Here are several examples.

Getting to Readiness

In October 2017, Defense Secretary James Mattis declared that his top goal for the coming year was to restore U.S. military readiness. In 2018, RAND researchers identified how to improve readiness levels across four military services.

For the U.S. Army, researchers identified expensive redundancies in the spare parts inventory system. This prompted the Army to change its policy, reducing sustainment costs by $100 million and ensuring that brigade combat teams can deploy with the spare parts they need. Additionally, RAND addressed challenges to rapid deployment. The commander of U.S. Army Europe used a 2018 analysis to reevaluate theater deployment plans and requirements. And the Army chief of staff used a groundbreaking RAND visualization of the movement of U.S. forces and equipment overseas to identify improvements to large-scale deployments.
For the U.S. Navy, RAND research on critical maintenance issues is helping ensure naval power projection and the ability to transport other services’ equipment. To do this, researchers analyzed ten years of cost and maintenance data. The Navy adopted RAND’s recommended remedial strategies in 2018 and used the analysis to propose an increase in its maintenance budget.

For the U.S. Marine Corps, researchers studied how to fix a seemingly minor problem that was affecting the readiness of tactical vehicles. The Marine Corps installed special ballistic glass on vehicle windshields and windows to prevent shattering, only to learn that the glass must be replaced every four years, at great expense. Researchers used a simulation model to estimate sustainment costs and vehicle downtime and identified steps that the Marine Corps could take to mitigate the problem.

The U.S. Air Force asked RAND to address pilot shortages and readiness declines. By digging deeply into the Air Force’s own data and reanalyzing their implications, RAND researchers showed a common assumption to be wrong: Heavy use of combat forces is not correlated with reported readiness for future conflict. So researchers devised a more accurate method of quantifying and reporting readiness. Air Combat Command adopted this new method immediately, and its commander has issued new guidance to address readiness shortfalls.

Improving Battlefield Medicine

When a U.S. soldier is wounded on a future battlefield, will the military be able to deliver blood and other critical medical help to distant locations under enemy fire? This question is becoming more pressing as potential U.S. adversaries increase their inventories of long-range attack capabilities.

Over the past five years, RAND has conducted ten research projects, about medical operations in denied environments, to address this problem. In 2018, this research prompted various military services to make concrete preparations. The Air Force, for example, increased blood supplies at forward treatment facilities. The Navy increased stock levels of coagulants for severe trauma cases. The special forces community began investigating the use of unmanned aerial vehicles for blood delivery. Moreover, the surgeon general of U.S. European Command (EUCOM) cited RAND’s research as the kind of analysis he required to make critical decisions. EUCOM will organize exercises with partner nations to ensure that their medical support structures can augment U.S. capabilities.

RAND research also identified how U.S. Africa Command (AFRICOM) could improve its medical rescue and treatment capabilities. In response, AFRICOM is now deploying more damage control surgery teams that can move surgical capabilities to patients during rescue missions and is decreasing alert times for rescue aircraft.

Cybersecurity for the Legislative Branch

Lawmakers around the world have been targeted by cyberattackers who want to read or manipulate their email. One best practice for reducing vulnerability is using two-factor authentication, but the U.S. legislative branch has not adopted this practice. The Library of Congress asked HSOAC in 2017 to evaluate which two-factor authentication systems might be most appropriate—and to deliver a preliminary report within 30 days so it could purchase a comprehensive system. The choice of vendor was particularly important because other legislative branch agencies might adopt the same system. The Library of Congress used HSOAC’s findings to select its technology system and vendor of choice. The research has also informed other legislative bodies and agencies, from Congress to the Government Accountability Office, which have been planning their own expanded investments in multifactor cybersecurity.

A Shipbuilding College for Australia

A robust national security for the United States depends in large part on the strength of allies and partners around the world. RAND analysis for key U.S. partners helps ensure the effectiveness of their defense sectors. In but one example: Australia has plans for an ambitious modernization of its naval surface ship and submarine fleets over the next few decades. Using analysis from a
2015 RAND study, Australia chose to reinvigorate its domestic shipbuilding industry rather than purchase its future vessels from overseas. Follow-on RAND research conducted in 2016 and 2017 examined ways Australia can meet the significant workforce demands that the shipbuilding program will generate. This effort led the Australian government to establish the new Naval Shipbuilding College in Adelaide, the expected site of much of the country’s naval production. The college will coordinate the training in vocational and degree specialties needed by the industry. The new college was inaugurated in November 2018.

Impact in the Year Ahead

It frequently takes time—and timing—for excellent research to make a significant impact. Here are RAND projects that appear poised for impact in 2019.

Truth Decay

Another RAND Venture, a 2018 study defining and explaining the Truth Decay phenomenon, garnered significant attention. President Barack Obama put it on his summer reading list, George Will and other national commentators wrote about it extensively, and the term is now associated with RAND in the American lexicon. But, as cautioned in the analysis, Truth Decay developed over decades and will take decades to undo. In 2019, RAND researchers will publish follow-on studies exploring approaches to countering disinformation, changes in media content over time and ways to develop more-effective media literacy programs, and opportunities for rebuilding public trust in key institutions. This and other related research continue to press forward in pursuit of remedies.

Access to Opioid Treatment

Americans struggling with opioid addiction lack easy access to treatment, and those who are able to find specialty care often face long waitlists. A RAND study examined whether increasing treatment availability at primary care clinics would improve outcomes. It did. Primary care providers successfully delivered addiction treatment, resulting in more people being drug-free after six months. This finding helped change the conversation about opioid addiction and recast it as a treatable disease. Although the research has been cited as a model for how to transform primary care, health care providers will need to implement new practices and integrate them into their existing care settings for patients to start realizing benefits. Federal spending to stem the opioid epidemic can be put to use to facilitate such programs.

Shaping National Defense Policy

The final report of the National Defense Strategy Commission, a blue ribbon, bipartisan group created by Congress to examine the National Defense Strategy of 2018, concluded that “the United States confronts a grave crisis of national security and national defense” that has not yet been addressed by the U.S. Department of Defense or the nation as a whole. The first footnote of the report names ten major, unclassified sources reviewed by the commission in its work, the first six of which were studies or congressional testimonies by RAND researchers between 2015 and 2018. The subjects ranged from protecting NATO’s eastern flank, to countering China, North Korea, and Russia, to threats to U.S. assets in space. Seven RAND researchers appeared before the commission to inform its deliberations, a tangible example of RAND’s value to U.S. national security influencers and decisionmakers as they contend with an array of difficult and sensitive challenges.
Single-Payer Health Care for New York

A complex and controversial draft bill pending in the New York legislature would provide health insurance to everyone in the state, with no co-pays, deductibles, or premiums, regardless of immigration status. The New York State Health Foundation turned to RAND for an objective analysis of the likely costs and effects. The research has been widely cited by proponents and opponents and is likely to continue to influence the proceedings when the newly elected legislature considers the bill in 2019.

Pennsylvania State Colleges

The Pennsylvania legislature asked RAND for a comprehensive overview of and objective recommendations about how to restructure the struggling state university system. With enrollment shrinking, Pennsylvania’s 113 public and private two- and four-year colleges are being forced to compete with each other, and its 14 state-run colleges are sinking deeper into debt. The study offered five options for addressing the problem. The legislature is expected to take up a reform bill in 2019.

Rightsizing Flag Officers

How many general and flag officers does the Pentagon need? At the request of the Office of the Under Secretary of Defense for Personnel and Readiness, a RAND team developed a rigorous, adjustable, and repeatable methodology to review and evaluate all requirements for general and flag officer positions against defined criteria. The U.S. Department of Defense has begun using the results to identify opportunities to eliminate or downgrade positions to manage costs and realize efficiencies while retaining positions needed to fulfill critical responsibilities.

Combat Aircraft for the UK

RAND Europe’s support to the British government, including the Ministry of Defence (MoD), culminated in 2018 in the UK’s first Combat Air Strategy. RAND’s analysis informed the development and implementation of the strategy, and a director in MoD described RAND’s long-term analytical support as “pivotal” to articulating challenges and influencing policy in the air domain. RAND Europe research will likely inform critical government decisions in 2019, such as whether to launch a combat air program that will cost more than £2 billion.