THE RAND CORPORATION IS A RESEARCH ORGANIZATION THAT DEVELOPS SOLUTIONS TO PUBLIC POLICY CHALLENGES TO HELP MAKE COMMUNITIES THROUGHOUT THE WORLD SAFER AND MORE SECURE, HEALTHIER AND MORE PROSPEROUS.
MESSAGE FROM THE CHAIR AND THE PRESIDENT
High-quality, objective research and analysis are RAND’s stock-in-trade. Increasing the impact of that research and analysis is RAND’s overarching institutional priority. But the role of facts and analysis in policymaking and in American public life has diminished over the past two decades—and this regrettable trend is not limited to the United States. The very foundations of democracy have begun to erode within and outside U.S. borders. Technology is revolutionizing societies at unprecedented speed, fixing some of the world’s ills while making people and institutions everywhere increasingly vulnerable to misinformation and disinformation.

Our vision is for a world where facts matter; where the best minds find ways to help people and organizations flourish; where ideas are tested, debated, and refined; and where the best ideas rise to the top and are shared with all who want to and can use them.

The RAND Corporation is a one-of-a-kind organization—part think tank, part consultancy, part university—which makes it uniquely positioned to analyze—and to solve—humanity’s biggest, most complex problems. Every day, researchers and doctoral students at RAND are energized by taking on these challenges to improve the collective safety and security, health, and well-being of citizens.

We turn to evidence, data, and facts to help communities rebuild and become more resilient after disasters; devise strategies to thwart illicit activities in cyberspace; deescalate and deter international conflicts; cultivate better outcomes for students; and more. Restoring facts to their rightful place at the center of decisionmaking is a challenge everyone at RAND embraces.

To move forward, impact people’s lives in meaningful ways, and shape a better future, we must lead with the facts. We thank the clients, grantors, and donors who support our vision, make our work possible, and help us move forward—FACT FORWARD.

KAREN ELLIOTT HOUSE
Chair, RAND Board of Trustees

MICHAEL D. RICH
President and Chief Executive Officer
Contents

5  Research and Analysis
46  Clients and Grantors
48  Pardee RAND Graduate School
54  News
60  Leadership
68  Fundraising
72  By the Numbers
Each year, clients and grantors around the world turn to RAND for empirical, nonpartisan, and objective research and analysis, bringing us their most vexing and complex public policy challenges. These organizations include cabinet-level agencies, charitable trusts, city governments, and community nonprofits. These decisionmakers include senior policymakers, program managers, CEOs, administrators, doctors, thought leaders, and educators. They have different concerns, different priorities, and different constraints. But these diverse clients and grantors have one thing in common: They need analysis that relies on the best data and the strongest analytical methods. On the following pages, we share research highlights from 2018. These projects demonstrate an approach to problem-solving that is founded on rigor and dedicated to advancing the public good.
Most people with mental health problems experience their first brush with their illness early in life—starting around high school and into their early twenties.

So to help more people get the care they need, it makes sense to target this demographic with mental health awareness initiatives. But what makes an initiative effective?

The Los Angeles County Department of Mental Health asked RAND researchers to find out, tasking them with evaluating its community engagement campaign, WhyWeRise.

The campaign seeks to increase awareness and mobilize youth to advocate for access to quality mental health care for all. To do so, the campaign used social media and WeRise, a unique multiweek event that brought an immersive art gallery, rally, performances, and workshops to downtown Los Angeles for the general public.

WhyWeRise also encourages engagement with mental health along a continuum, from self-care to professional treatment services, and aims to increase awareness of how to seek mental health care.

RAND researchers surveyed WeRise attendees at the event, analyzed Los Angeles–based Twitter conversations related to mental health, and conducted a web-based survey of a broader population of Los Angeles County youth to evaluate the campaign’s reach and impact.

Overall, the evaluation found evidence that WhyWeRise showed impressive reach into the Los Angeles community, with one in five young people exposed to the campaign in some way during the brief period examined.

People exposed to the campaign also reported more supportive attitudes toward people with mental illness and greater motivation toward action around mental health issues.

Researchers found early evidence that the campaign might be associated with positive outcomes, such as increased supportive and understanding attitudes toward people with mental illness, awareness of the challenges people with mental illness face, knowledge of how to get help for mental health challenges, and, importantly, empowerment and mobilization toward activism around mental health issues.

The campaign is ongoing, with an engaging website and colorful outdoor ads throughout the county.

Learn more at www.rand.org/t/RR2754
Military Families on the Move

In any given year, roughly one-third of U.S. service members experience a “permanent change of station”—a move. These moves can strain families, disrupt a spouse’s career, and make those service members think twice about staying in the military, at least in the short term.

The U.S. Department of Defense, under a congressional mandate to better understand the impact such frequent moves can have, turned to RAND. Researchers reviewed previous studies, interviewed experts, and analyzed survey results and other data. They focused especially on what the military could do to help families through a permanent change of station, known to service members as a PCS.

They found that service members report less satisfaction with the military and lower intention to stay during the months immediately before and after a PCS move. Their spouses reported an increase in financial stress. Those changes, though, were generally short-lived; by most measures, the service members and their spouses had rebounded within about two months of the move.

The researchers did find evidence in the research literature that a PCS move can lead to a drop in spousal earnings. They also found some evidence linking PCS moves with spousal unemployment and underemployment.

But for almost every disruption associated with a PCS move, from child care to psychosocial well-being, the researchers found multiple support programs available to service members and their families. There was no evidence to suggest a need for new programs, although the researchers noted that many of the existing programs have not been evaluated.

What service members and their families really need, the researchers concluded, is more lead time to prepare for a move. That would at least allow them to start lining up movers, looking for housing, and taking care of the other chores involved with a permanent change of station.

Learn more at www.rand.org/t/RR2304

The military provides a broad suite of policies, programs, and services aimed at mitigating family disruptions during a permanent change of station. But it could improve the process and reduce disruptions, especially on the front end, by giving families more time to plan their relocations.

PATRICIA TONG
economist
Nobody signs up for the Army expecting a nine-to-five. But a survey of thousands of soldiers underscored the range of difficulties they face, even on stateside posts, and whether the Army is doing enough to help.

Researchers asked thousands of active-component soldiers at 40 installations about the biggest day-to-day challenges they and their families face. Some of the top responses would sound familiar in any office park: 44 percent said they felt stressed or overwhelmed, 43 percent had trouble sleeping, and 40 percent reported poor communication with their coworkers.

But then the researchers sat down with small focus groups of soldiers to dig into their problems and how they cope. Soldiers talked about taking their children to early-morning exercises because the post’s child care center hadn’t opened yet. Or missing a day of work because they had to drive an hour off base to see a medical specialist. Or just trying to do their jobs amid swirling rumors of the next deployment.

Many of the soldiers said they were reluctant to ask for help, even when they needed it. But the survey showed that almost 80 percent of the soldiers who reached out for help were able to get the support they needed.

The study, funded by the U.S. Army, was the first to assess Army support programs through the eyes of those who use them, down to the level of individual garrisons. That approach yielded some important insights into how the Army could make garrison life a little easier for soldiers and their families.

Longer child care hours. More partnerships with nearby civilian health care providers. More time and training for leaders to engage with their troops and help them navigate the Army bureaucracy.

What soldiers wanted, often, was a little more flexibility in existing programs, and a little more information to help them access that support without having to go to their superiors with every problem.

► Learn more at www.rand.org/t/RR2148
Cyber Resilience

Threats and risks associated with the internet and its innovations could unravel technology’s many benefits. Adequate cybersecurity capacity at the national level is key to ensuring resilience against cyber incidents.

Researchers at RAND Europe developed a proof-of-concept toolkit to help countries develop policy and investment strategies to confront the complex challenges they face in the cyber domain. Countries can use the toolkit to strengthen their efforts to confront cyber threats that might otherwise erode the social and economic benefits of new technologies.

The United Kingdom Foreign & Commonwealth Office commissioned the project. Researchers first analyzed existing cybersecurity challenges, opportunities, and needs faced by policymakers and implementers operating in cybersecurity capacity development. They then developed the toolkit to help policymakers put their capability development plans into action.

The toolkit builds on the Cybersecurity Capacity Maturity Model for Nations created by the Global Cyber Security Capacity Centre at the University of Oxford. It covers five dimensions to build cyber capacity and develop a resilient cybersecurity posture: policy and strategy; cyber culture and society; cybersecurity education, training, and skills; legal and regulatory frameworks; and standards, organizations, and technologies.

Each section includes layers of instruction that help policymakers advance national cybersecurity capacity. At each step, the toolkit provides guidance on implementation, emphasizing specific approaches and known challenges, using real-life case studies as examples.

The recommendations in the toolkit are framed flexibly to cater to different national needs and contexts. The goal is to help policymakers translate their cybersecurity needs and requirements into tangible policy initiatives and investment strategies.

Learn more at www.rand.org/t/RR2072
EDUCATION AND LITERACY
Improving Student Outcomes

Louisiana has launched one of the most ambitious efforts to improve public schooling in the nation. Researchers are following its progress as a case study for other school systems.

The state is confronting low kindergarten readiness, low student-assessment scores, and low rates of college attainment, as well as high poverty and unemployment. Its policy actions target every step of the student experience, from preschool to college or career training.

Researchers sponsored by the Baton Rouge Area Foundation interviewed state school officials, reviewed policy documents, and met with teachers and school leaders. They concluded that Louisiana’s approach stands out for its systemwide focus, its planning, and the way it has communicated its new expectations through mandates, incentives, and resources.

For example, the state established a new rating system for early childhood programs, and a new credential requirement for early childhood educators. But it also uses tax credits and bonuses to encourage quality programs.

The state also provides clear information and incentives to encourage the use of high-quality, standards-aligned curricula, assessments, and professional development. It now requires high school students to complete college-required assessments and financial aid applications. It also created new career and technical education pathways.

One key challenge will be ensuring that school systems have the staff, training, and financial resources to meet those new requirements, the researchers wrote.

Their study continues. Future reports will look at what teachers and school leaders think about the reform efforts, and how those efforts may be related to student outcomes.

Learn more at www.rand.org/t/RR2303

Few other U.S. states have experienced as much political and social turbulence in their education systems in recent years. Looking at how Louisiana is addressing these challenges can offer some important lessons to other states and school systems.
Better Training for School Principals

Too many school principals lack the leadership skills they need when the bell rings. A private foundation has invested $49 million in the belief that better training for principals will lead to better outcomes for their schools.

The Wallace Foundation asked RAND to follow its University Principal Preparation Initiative for four years, to highlight lessons that other programs might learn from it. In its first year, researchers found the initiative was already shifting the foundations of principal training by encouraging more real-world partnerships with local school districts.

Past research shows that successful principal preparation programs should include partnerships with local school districts. Our report illustrates such engagement is feasible, valuable, and critical to designing these programs.

The need for such change has been apparent for years. In one survey, 89 percent of school principals said their university programs did not prepare graduates well for the real world. The vast majority of superintendents in another survey rated the level of preparation for principals as less than effective.

The Wallace Foundation partnered with seven universities in different states to redesign principal training. Its initiative included funding for new curricula better aligned with the daily realities of being a principal. It also fostered strong university partnerships with local school districts, to give them a voice in designing programs to better meet their needs. And it promoted new dialogue with state leaders, to consider policies that could enhance principal preparation.

Researchers interviewed program leaders, university administrators, and school district and state-level officials. They convened focus groups with principals-in-training and their school-based mentor principals. They found that there had been some challenges in the first year of the initiative: e.g., turnover in some leadership roles, and a lengthy process at some universities to get new courses approved.

But the participating universities, in collaboration with district partners, had started to redesign their programs and had looked for ways to provide more mentoring and real-life experience in the classroom. Some states had also begun moving toward higher standards.

A future report will take a closer look at state reform efforts supporting principal preparation. Researchers expect to release their final report on the Wallace initiative and how it changed the experience for aspiring principals in 2022.

Learn more at www.rand.org/t/RR2612
The wildfires that exploded through California’s foothill communities in 2018 were the most destructive in state history. Within a few decades, though, the risks could be much higher.

Researchers ran more than 700,000 computer simulations to estimate how climate change could reshape the fire season in two especially vulnerable areas. They found that the average number of acres burned in the Sierra foothills of Northern California could double by 2055. Without significant cuts to greenhouse gas emissions, the number could double again by 2100.

They found only minor impacts in the second area they studied, the western portion of San Bernardino County in Southern California. But they cautioned that the science there was not as conclusive as in the Sierras.

The study, sponsored by the California Natural Resources Agency, also found that insurance rates in those high-risk areas are rising faster than in other parts of the state. Yet many insurers believe the rates still don’t fully reflect the true risk and blame state regulations for keeping them artificially low.

Homeowners in those areas can expect their rates to increase by nearly 20 percent by 2055, the researchers found. In response, homeowners might buy less insurance; the researchers estimated the ratio of insurance coverage to home value could fall by up to 6.5 percentage points.

That underscores a trade-off facing California regulators. Higher insurance rates could discourage further development in fire-prone areas and encourage the people living there to harden their homes against flying embers and other wildfire dangers. But they might also create economic hardship for some households.

The stakes for property owners are high and rising. Last year’s fire season generated at least $9 billion in claims for lost homes, businesses, cars, and other property.

Rates that reflect actual risk have several advantages, even if that means high rates in high-risk areas.

Learn more at www.rand.org/t/EP67670

LLOYD DIXON
senior economist and director,
RAND Center for Catastrophic Risk Management and Compensation
Hundreds of thousands of Americans with serious medical conditions rely on palliative care to relieve their suffering and improve their quality of life. As more hospitals establish palliative care programs, they need to know what works best, for whom, and under what conditions.

Researchers pulled together evidence from nearly 150 studies to inform revised practice guidelines for high-quality palliative care. They found a substantial body of evidence for some palliative care practices, but low-quality and inconsistent evidence for others.

Palliative care aims to relieve the pain, symptoms, and stress of serious illness during treatment, not necessarily at the end of life. Between 2000 and 2015, the proportion of hospitals offering palliative programs tripled, from around 25 percent to 75 percent.

The researchers found moderate evidence that a common feature of those programs, interdisciplinary care teams, improves the quality of life for patients with advanced illnesses. They also found moderate evidence that ethics consultations improved decisionmaking in the intensive care unit, which could help reduce the use of often-futile treatments at the end of life.

The review found some evidence that music or art therapy can ease anxiety and depression, and that bereavement support appears to provide meaningful relief to caregivers.

But evidence to guide best practices in the very last days of life is limited, the researchers found. So is the evidence base for some aspects of home care, social needs assessments, and culturally sensitive care. That suggests a need for more research to fill in those gaps.

The research, sponsored by the National Coalition for Hospice and Palliative Care, informed the fourth edition of the National Consensus Project Clinical Practice Guidelines for Quality Palliative Care. It was funded by the Gordon and Betty Moore Foundation, the Gary and Mary West Foundation, The John A. Hartford Foundation, and the Stupski Foundation.

Learn more at www.rand.org/n181031
Residents of the Gulf Coast who lived through the Deepwater Horizon oil spill continue to report higher levels of anxiety, according to some studies. But a survey of more than 2,000 residents found the explanation is not as simple as it may seem.

The April 2010 spill was the biggest environmental disaster in U.S. history. People who experienced its effects firsthand—through property damage or job loss, for example—were more likely to show signs of depression, anxiety, and general mental distress in the years afterward, previous studies found.

Researchers surveyed a random sample of 2,520 Gulf Coast residents to see whether the disaster continues to take an emotional toll. They found that those most impacted by the spill were more likely to report symptoms of anxiety, especially about their physical health. The researchers also tested for depression and alcohol abuse but found no correlations.

The study was the first of its kind to also explore whether other stressful or traumatic experiences, like sexual assault or a bad accident, might exacerbate the emotional toll of the disaster. It also accounted for previous calamities that have hit the Gulf Coast in recent years, like hurricanes and floods.

That history of trauma, and not the Deepwater Horizon spill by itself, explained the higher rates of anxiety, the survey results showed. The researchers found only one impact associated with the spill, over and above past traumas. Residents impacted by the spill continue to report higher illness anxiety (worry about their health).

As policymakers and health care providers prepare for future disasters, the study shows it’s important that they not just respond to the immediate trauma. The context of past traumas may be an even better predictor of behavioral health challenges. Illness anxiety also deserves more study as a stand-alone consequence of environmental disasters.

The study was funded by a grant from the Gulf of Mexico Research Initiative to the Consortium for Resilient Gulf Coast Communities. The consortium (www.resilientgulf.org) is a partnership of the RAND Gulf States Policy Institute, Tulane University, Louisiana State University, and the University of South Alabama.

► Learn more at www.rand.org/t/EP67723
Heavy rains, destroyed homes, uprooted trees, and near-total power and water outages plagued Puerto Rico in September 2017, when it was struck by Hurricane Irma and Hurricane Maria in quick succession.

RAND researchers traveled to Puerto Rico to provide in-depth analytical support to the Federal Emergency Management Agency (FEMA) as they evaluated housing; economic issues; health and social services; natural and cultural resources; governance and civic institutions; electric power systems and grid restoration; environmental issues; and other infrastructure systems.

Working in close collaboration with FEMA, the government of Puerto Rico, and cognizant federal agencies, the team identified damage, needs, and priorities for recovery, as well as potential courses of action and their related costs. Their damage and needs assessment described the pre-storm conditions and the specific impacts and damage from Hurricanes Irma and Maria in each of the identified sectors. The team also created a decisionmaking support tool to help the government make informed choices in aligning chosen courses of action to overall plan objectives.

This comprehensive and collaborative planning process was intended to ensure that the recovery plan is able to guide the substantial investments needed to support Puerto Rico’s rebuilding effort, and to outline necessary actions to mitigate vulnerabilities to future disasters.

The RAND team contributed to a congressionally mandated report that describes the government of Puerto Rico’s long-term recovery plan, released by the Governor of Puerto Rico in August 2018.

Many of Puerto Rico’s challenges—economic, social, and infrastructure issues that exacerbated the disaster’s impact—long predate the 2017 hurricanes. This research project is a step toward making the necessary changes and investments that will help Puerto Rico rebuild and become more resilient in the years ahead.
“Gaza has a water and sanitation crisis of epic proportions.” So opens a report into what has gone so wrong in Gaza, and what the international community can do to help.

More than a quarter of all reported disease in Gaza is due to poor water quality and access. As many as 2 million people live in the crowded strip of land bordering Israel and Egypt. Almost all get their drinking water from unregulated tanker trucks, and one-third lack sanitary sewer access. So much untreated sewage flows from Gaza into the Mediterranean Sea every day that it could fill more than 40 Olympic-sized swimming pools.

Researchers interviewed experts and government officials from Gaza, the West Bank, Israel, and the international community, and reviewed previous reports on the water crisis. They concluded that a confluence of events has dramatically worsened the situation in recent years.

Conflict with Israel has left much of Gaza’s infrastructure damaged. Border restrictions and limits on items that could also be used for military purposes, including technical equipment, have hindered repairs. At the same time, an intra-Palestinian rift has led to severe power cuts, limiting water supply and wastewater services, and leading to a near-collapse of Gaza’s medical sector.

The researchers recommended greater investment in water and wastewater treatment infrastructure, new power infrastructure, and more water and electricity deliveries from outside Gaza. They also urged Israel and Egypt to ease import restrictions on materials and equipment needed to restore water infrastructure into Gaza.

The international community could help by funding the development of proposed desalination and sewage treatment plants—and the operation of those plants going forward. In the long term, Gaza will need a more reliable way to store and distribute water, as well as a better sewage system that can serve all of its residents.

Learn more at www.rand.org/t/RR2515

This project was a RAND Venture—funded by unrestricted gifts from philanthropic supporters. RAND Ventures is an important way to pursue visionary ideas; address critical problems that are under-researched; shape emerging policy debates; and devise innovative solutions for solving complex policy challenges.
The United States needs a tougher, more coordinated response to the flood of online disinformation coming from Russia.

The threat “is here to stay,” researchers concluded after a comprehensive review of Russian operations on social media. Yet the federal agencies working to address that threat often do not know what their sister agencies are doing and do not communicate with the social media companies most directly involved.

The researchers described a flow of disinformation from the highest levels of the Russian government, through media proxies and online trolls, and onto social media platforms like Facebook and Twitter. They found that efforts to break that “disinformation chain” have focused too closely on piecemeal solutions, like making political ads more transparent, without pulling back to address the bigger picture.

That will require much more cooperation, not just among government agencies, but also with social media companies, the researchers concluded. They proposed a regular working group to bring together government officials, social media representatives, and other experts to discuss emerging threats to online discourse. That would also provide a forum for the government to share as much unclassified information as it can on Russian strategy, tactics, and affiliated accounts.

The United States also should pursue “clear and enforceable” international norms for what constitutes unacceptable online behavior by state actors like Russia. At the same time, social media platforms need to improve their algorithms to detect disinformation, and be more transparent about how they promote, demote, or remove content.

Punishments, such as sanctions, are not likely to convince Russia to back away from its social media operations, the researchers concluded. That means a strong, well-coordinated defense is the best option for breaking the Russian chain of disinformation.

Without cooperation and coordination, efforts will remain piecemeal and inadequate, and the United States will remain vulnerable to influence campaigns by Russia and other adversaries.

Learn more at www.rand.org/t/RR2740

This project was a RAND Venture—funded by unrestricted gifts from philanthropic supporters. RAND Ventures is an important way to pursue visionary ideas; address critical problems that are under-researched; shape emerging policy debates; and devise innovative solutions for solving complex policy challenges.
Despite nearly 70 years of war and strife on the Korean peninsula, both North Korea and South Korea have expressed significant interest in unification. A RAND report concluded that neither side is fully prepared to make it happen.

The report identified three overarching contexts that could lead to unification of the North and South: a major war, a collapse of the North Korean regime, and a peaceful unification negotiated by both sides. It then explored different paths within these contexts to anticipate challenges and provide recommendations for achieving unification.

For example, it noted that North Korea’s desire for isolation from the outside world could hinder a peaceful reunification, even if one could be negotiated. North Korean strongman Kim Jong-un appears unwilling to consider a path that would weaken his control.

Chinese intervention would also pose a serious challenge to unification, causing chaos on the Korean peninsula and threatening war between South Korea and China.

The report found that South Korea should try to avoid any path that involves armed conflict on the peninsula. Conflict outcomes could be disastrous for both countries if the North were to employ weapons of mass destruction.

It suggested South Korea should develop policies to ensure the North Korean elite a favorable life post-unification. That could help ensure their cooperation in the unification process.

The report concluded that the best path to unification would involve the collapse of the North Korean regime followed by negotiations with whatever government replaces Kim Jong-un. But such a unification could take years to accomplish.

The report was sponsored by the Korea Foundation and conducted within the International Security and Defense Policy Center of the RAND National Security Research Division.

Learn more at www.rand.org/t/RR2808

The paths considered reflect that either North or South Korea might control the unification process or share that control, that some paths might fail to achieve a stable unification outcome, and that there is considerable uncertainty in all the potential outcomes.
Insurance and Liability in the Age of Driverless Cars

Car insurance has always been based on the idea of individual driver liability, which raises a question: What happens when there are no drivers?

Prominent tech companies are racing to get autonomous vehicles—driverless cars—onto the road. Federal transportation regulators expect cars with fully automated safety features and highway autopilot to get the green light by 2025. All of which means the insurance industry needs to start thinking about the future.

To help, researchers convened a daylong workshop that brought together insurers, attorneys, regulators, autonomous vehicle advocates, and consumer representatives.

The workshop attendees agreed that it could be decades before autonomous vehicles make up all, or even most, of the American auto fleet. That will give the industry time to adapt, even as it begins to face more situations in which a manufacturer, not a driver, is at fault in a crash.

Manufacturers may resist this shift, leading to uncertainty. One possible solution: Insurers could charge consumers more or less to insure their cars based on whether the manufacturer has agreed to some liability in the event the cars malfunction and crash.

Insurers said they need data on how autonomous vehicles perform to start considering reasonable rates to insure them. But they said they get the same response from all car companies when they ask to see their numbers: That’s proprietary. Finding a way to make more of those data available would help the industry take a more proactive approach to autonomous vehicles.

It’s possible that adjudicating blame in a car crash becomes a much less pressing problem as autonomous vehicles become more reliable. The cars themselves might be able to explain what happened, allowing an algorithm to recreate the crash and assign blame. Even that might not happen so often: Around 94 percent of today’s serious crashes are due to human error.

In the event of a car crash, if a person in an autonomous vehicle was not actually driving, the question will be, “Who should be held responsible?” The insurance industry will play an important role in answering that question.

Learn more at www.rand.org/t/CF383

James Anderson
Senior Behavioral Scientist
and Director of the RAND Institute for Civil Justice
Understanding China’s Air Force

China is building up its air force to compete with—and, if necessary, defeat—the United States. Some of its capabilities and aerospace doctrines seem to follow a familiar model: that of the United States itself.

A study commissioned by the U.S. Air Force found that China is working to develop air power sufficient to deter the United States from risking conflict with it. Based on Chinese writings and interviews with experts, the study also found that China appears to be copying the air forces of other nations where it can.

The U.S. Air Force’s vision statement, for example, calls for “global vigilance, global reach, and global power.” Chinese writers talk about the need for “bright eyes, strong fists, and long arms.”

The Chinese military has invested in advanced fighters, ballistic and cruise missiles, air-defense systems, and space weapons that, in many cases, imitate what the United States and others have. That is allowing it to modernize its force quickly and at lower cost, and to better match the capabilities of the United States and other rivals. It still innovates where needed; for example, it is developing hypersonic glide missiles that could challenge any existing defense system.

The overwhelming majority of China’s aerospace development is focused on defeating the United States if a major conflict ever broke out, the study concluded. China’s military is working under a directive from President Xi Jinping to prepare “to fight and win wars.”

Understanding how China is building up its air force is vital to developing contingency plans for any potential conflict, the study noted. In a crisis, that would help the United States anticipate what capabilities China could field, and where and how it might field them, as well as assess its areas of weakness.

As the People’s Liberation Army seeks to deny U.S. advantages and project power in the face of U.S. technological superiority, it has copied when it can and innovated where it must.

[Learn more at www.rand.org/t/RR2588]
Army Security Cooperation

The U.S. Army has worked with dozens of foreign militaries in recent years to build up their capabilities and make them more effective, long-term partners. But it had no single mechanism to assess whether those cooperative efforts were accomplishing national security goals.

The Army’s Deputy Chief of Staff asked RAND to determine when such partnerships have the greatest impact, and how to judge them going forward. Researchers reviewed more than 9,000 security cooperation efforts, ranging from information exchanges to peacekeeping missions, involving 150 countries between 2009 and 2014.

They also reviewed the literature on both Army assistance and international development. They found that such activities often succeed or fail based on five characteristics of the partner country: its strategic importance, the strength of its democratic institutions, its domestic stability, its capacity to absorb support, and its cultural similarity. How much aid the country gets, and how consistently, are also critical factors.

The Army seems to have taken those characteristics into account in planning its past partnerships, the researchers found. It has, for example, focused on outreach and relationship building in countries less like the United States. With other strong democracies, it tends to favor joint exercises and deterrence activities. But it needed a better system to make sure those security partnerships follow best practices.

The researchers created a framework to help the Army prioritize and plan future cooperation efforts. It requires the Army to assess the partner country, explain how it thinks cooperative activities will achieve the outcomes it wants, and describe how it plans to monitor and evaluate those activities.

It’s a change in mind-set, the researchers wrote, challenging Army planners to think through every link in the chain before signing off on an international partnership.

Learn more at www.rand.org/t/RR2165

Success is not ultimately measured by the provision of equipment or training. It is measured by the extent to which security cooperation activities help achieve U.S. objectives.

ANGELA O’MAHONY
senior political scientist
The next few decades could bring new crimes, new security threats, new challenges to world order—all built layer by layer by 3D printers.

The technology to print what we need, when we need it, may prove to be one of the most world-changing advances of modern times, researchers concluded. But those new possibilities will come with new perils.

Cyber sabotage, for example. If hackers could get into the computer files used by a 3D printer, they could introduce tiny but catastrophic flaws in the production designs, invisible to the naked eye. That will make cybersecurity a potentially life-and-death challenge as more critical parts, such as airplane engine components, come off a 3D printer.

The printers can already produce everything from a toothbrush to a prosthetic hand for about the same price. That will revolutionize manufacturing but could put traditional factory workers out of a job. Those workers will need to be retrained to use 3D printers to avoid what otherwise could be massive job loss.

At the same time, countries will be able to keep more of their production in-house when it doesn’t save money to outsource it. That could weaken the economic ties that have helped bring together nations and promoted at least some international order. Rogue states like North Korea could also skirt international sanctions by printing whatever they want.

But there’s another danger here, and that’s overregulation. 3D printing will present some real challenges to security and global stability, but overreacting to those challenges could smother a new era of innovation. We may one day be able to print houses and heart valves—if we get it right.

What’s needed is greater public discussion about how to address the potential negatives without stifling the positives, the researchers concluded. That discussion needs to start now.

Learn more at www.rand.org/t/PE283

This project was a RAND Venture—funded by unrestricted gifts from philanthropic supporters. RAND Ventures is an important way to pursue visionary ideas; address critical problems that are under-researched; shape emerging policy debates; and devise innovative solutions for solving complex policy challenges.
As with any technology, there are positives and there are negatives. We need to think through those negatives before they become real problems that society is not prepared to deal with.

TREVOR JOHNSTON
political scientist
Opportunities abound for criminal justice agencies to make better use of information technologies, such as big-data analytics. But we found a broad need for agencies to better understand how to use and acquire new technologies efficiently and effectively.
What will the future of criminal justice look like? Researchers working with the Bureau of Justice Assistance convened an expert advisory group to look just over the horizon and anticipate technological needs and opportunities.

The Criminal Justice Technology Forecasting Group brought together federal, state, and local law enforcement officials, experts, and academics. It focused on how technology could evolve in the next three to five years, and what that would mean for law enforcement and society.

Advances in information technology could provide opportunities to improve law enforcement, the group concluded. But those advances are hampered by a lack of clear and compelling business cases; a lack of established processes to implement them; a lack of nationwide sharing capabilities; and problems with ensuring security, privacy, and civil-rights protections.

Big data, for example, could represent a breakthrough opportunity, but only if fundamental rights are protected. Police agencies might try to use arrest and call records to better identify people, places, and times at higher risk of crime. Such uses of data, however, raise immediate concerns about privacy and civil rights, which need to be addressed long before real people are involved.

Law enforcement agencies also will face continuing pressure from the public to minimize the use of force while still cracking down on violence. That points to a need for more research into technologies and practices that can reduce crime while also improving community relations. As part of that, agencies should continue to invest in developing less-lethal options to subdue or detain suspects without using deadly force.

The criminal justice system, at all levels, must upgrade its administrative policies and procedures to take full advantage of emerging technologies. Addressing those shortfalls will be crucial in the coming years, and could help agencies mitigate public concerns when they roll out new technology. That could help those technologies make the jump from individual pilot projects to fieldwide state of the art.

Learn more at www.rand.org/t/RR1987
WORKERS AND THE WORKPLACE
Women in the U.S. Air Force

Roughly one in five officers in the Air Force is a woman, and the numbers decline significantly as leadership ranks rise. One reason for the lack of female representation: Women tend to leave the active-duty Air Force at higher rates than men.

RAND researchers conducted focus groups comprising nearly 300 female officers to better understand the factors they consider when deciding to remain in or separate from the active-duty Air Force.

Female officers highlighted several areas as important considerations. Family and personal life were prevalent discussion topics, including issues surrounding children, pregnancy, spouses, and dating. Career path flexibility and workplace dynamics were also factors mentioned in female officers’ decisionmaking. And broader Air Force and military issues played a role, with participants citing factors such as frequent moves and deployments.

The researchers offered several recommendations to address the most prominent themes among the key retention factors.

For example, to address family and personal life concerns, recommendations focused on improving child care options, increasing parental leave, and providing designated nursing facilities.

Recommendations to address career-related issues included providing more flexibility for transferring into and back from the Air Force Reserves, offering separate technical career tracks, and providing a structure for allowing more cross-training opportunities into other career fields.

To address work environment and broader military factors, the researchers also recommended providing greater education to leaders on the importance of creating and modeling positive work-life balance and exploring a more decentralized assignment process to allow officers more autonomy in assignments.

This research was cosponsored by the Office of the Assistant Secretary of the Air Force for Manpower and Reserve Affairs and the Air Force Deputy Chief of Staff for Manpower, Personnel, and Services.

Conducting focus groups gave us the opportunity to understand female officers’ personal lives, work environments, and more. This approach also allowed participants to share their own ideas about changes to Air Force policies and programs that might help improve retention of female officers.

Kirsten M. Keller
senior behavioral scientist and associate director, Manpower, Personnel, and Training Program, RAND Project AIR FORCE

Learn more at www.rand.org/t/RR2073
Fewer than 40 percent of American workers now follow the traditional path to retirement, working full time until they reach a certain age and then stepping away completely. Efforts to support older workers on the job need to account for the many other paths they may take.

Researchers reviewed the labor market histories of thousands of workers between their mid-50s and early 70s. They found that the majority kept working when they reached retirement age, often at reduced hours, or left the workforce only to take another job later.

Workers with pensions or comfortable private savings, and those in poor health, were the most likely to take the traditional path to full and permanent retirement.

The study, sponsored by the Alfred P. Sloan Foundation, was among the first to also explore what psychological factors kept workers on the job later in life. It found that extroverts were more likely to follow nonstandard paths to retirement than introverts. And workers with high cognitive ability, as measured by a memory test, were more likely to work past age 65 than those with lower cognitive ability.

The findings suggest that workplace policies that accommodate the needs of older workers might help them stay on the job longer. Those could include flexible work schedules, part-time work, or jobs with reduced physical demands.

As people live longer, they might need to extend their working lives to maintain their standards of living. Having more older workers stay in the labor force would also take some pressure off of public programs, such as Social Security and Medicare.

That makes it especially important to understand the changing work patterns of older workers, and what influences them. Policies aimed at helping people work longer might be more effective if they take into account the many pathways to retirement, and the different needs of workers who follow them.

Learn more at www.rand.org/t/RB10022

Nontraditional Paths to Retirement

Flexible schedules, part-time work, or self-employment later in life might help seniors stay in the workforce longer.

SUSANN ROHWEDDER
senior economist and associate director, RAND Center for the Study of Aging
Clients and Grantors

U.S. GOVERNMENT
Administrative Office of the United States Courts
Consumer Financial Protection Bureau
Department of Commerce
National Oceanic and Atmospheric Administration
Department of Defense
Combatant Commands
Defense Centers of Excellence
Defense Security Cooperation Agency
Department of the Air Force
Department of the Army
Medical Research Acquisition Activity
Department of the Navy
Marine Corps
Naval Postgraduate School
Joint Staff
Office of the Secretary of Defense
Office of the Director, Cost Assessment and Program Evaluation
Under Secretary of Defense for Acquisition, Technology, and Logistics
Defense Advanced Research Projects Agency
Under Secretary of Defense for Personnel and Readiness
Under Secretary of Defense for Policy
Special Operations Joint Task Force–Afghanistan
Unified Combatant Commands
Department of Education
Institute of Education Sciences
Department of Energy
National Renewable Energy Laboratory
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
Health Resources and Services Administration
National Institutes of Health
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Cancer Institute
National Center for Complementary and Integrative Health
National Heart, Lung, and Blood Institute
National Institute on Aging
National Institute on Alcohol Abuse and Alcoholism
National Institute of Allergy and Infectious Diseases
National Institute of Dental and Craniofacial Research
National Institute of Diabetes and Digestive and Kidney Diseases
National Institute on Drug Abuse
National Institute of Environmental Health Sciences
National Institute of Mental Health
National Institute on Minority Health and Health Disparities
National Institute of Nursing Research
Department of Homeland Security
Cybersecurity and Infrastructure Security Agency
DHS Headquarters
Federal Emergency Management Agency
Management Directorate
Science and Technology Directorate
Transportation Security Administration
U.S. Coast Guard
U.S. Customs and Border Protection
U.S. Secret Service
Department of the Interior
Bureau of Reclamation
Department of Justice
National Institute of Justice
Office of Justice Programs
Department of Labor
Employee Benefits Security Administration
Department of State
Under Secretary for Civilian Security, Democracy, and Human Rights
Under Secretary for Management
Under Secretary for Public Diplomacy and Public Affairs
Department of Veterans Affairs
National Center for PTSD
Millennium Challenge Corporation
National Science Foundation
Office of the Director of National Intelligence
Intelligence Community
Securities and Exchange Commission

U.S. STATE AND LOCAL GOVERNMENTS
Commonwealth of Massachusetts
Department of Public Health
Commonwealth of Pennsylvania
County of Allegheny
Legislative Budget and Finance Committee
Pittsburgh Public Schools
State of Arizona
Pima County
State of California
CalPERS
City of Santa Monica
Department of Health Care Services
Department of Industrial Relations
Department of Social Services
Los Angeles County
City of Los Angeles Mayor’s Office
First 5 LA
Probation Department
The Metropolitan Water District of Southern California
State of Illinois
City of Chicago
State of Louisiana
City of New Orleans
State of Michigan
Michigan Indigent Defense Commission
State of New York
NYC Opportunity
State of Ohio
Cincinnati Public Schools
State of Oregon
Multnomah County Health Department
State of South Carolina
State Fiscal Accountability Authority, Procurement Services

NON-U.S. GOVERNMENTS, AGENCIES, AND MINISTRIES
Canada
Department of National Defence
Commonwealth of Australia
European Union
Eurofound
European Centre for Disease Prevention and Control
European Commission
Directorate-General for Employment, Social Affairs and Inclusion
Directorate-General for Health and Food Safety
Directorate-General for Justice and Consumers
Directorate-General for Migration and Home Affairs
Executive Agency for Small and Medium-Sized Enterprises
European Defence Agency
European Parliament
Government of Japan
Kingdom of Saudi Arabia
Norway
Norwegian Ministry of Foreign Affairs
Republic of Korea
Korea Institute for Health and Social Affairs
State of Qatar
Qatar Fund for Development
United Arab Emirates
Embassy of the United Arab Emirates
United Kingdom
Defence Science and Technology Laboratory
Department of Health
Department for Transport
Department for Work and Pensions
Food Standards Agency
Healthy London Partnership
Home Office
Medical Research Council
Metropolitan Police
Ministry of Defence
Public Health England

RAND provides research services, systematic analysis, and innovative thinking to a global clientele.
Our relationship is symbiotic. Policy experiments within Pardee RAND feed into RAND research, which in turn drives Pardee RAND curricula, fuels intellectual growth, and enables a one-of-a-kind educational experience.

RAND research inspires innovative ideas for students’ dissertation topics; it raises new policy questions to be answered, and graduate work helps generate new approaches for solving them.

Whereas traditional graduate training is usually grounded in a single discipline, policy problems are inevitably cross-disciplinary. The Pardee RAND curriculum reflects this reality while flipping the traditional graduate model of “learn first, apply later” by integrating academic theory with real work alongside and in tandem with RAND researchers.

It’s a partnership and structure that possesses the powerful advantage of enhancing students’ motivation to learn while sharpening the sense of purpose and relevance in learning.
Pardee RAND injects a rich diversity of experience and new perspectives to RAND project teams and research agendas, and helps keep RAND at the forefront of methodological advances and the frontiers of policy innovation.

The school offers RAND research staff the opportunity to teach courses and workshops, serve on dissertation committees, build new capabilities and capacities for experimentation, and engage with and mentor the next generation of policy experts.

Pardee RAND remains one of the key differentiators that make RAND a truly unique entity: No other stand-alone research organization is home to a graduate school.
According to the school’s dean, Susan L. Marquis, “This change is imperative. As a catch-all term, ‘public policy’ stands for every major issue facing the United States and the world, from international terrorism to income inequality to underperforming schools. How we train the next generation of policy experts will help determine how effective we are in addressing those issues.”

A new approach

Pardee RAND was one of eight schools that established in the early 1970s the nation’s first graduate-level programs in public policy. They were traditional academic programs, grounded in economic theory, with a focus on working through the federal government to solve problems. For the most part, they still are.

But the world doesn’t work that way anymore. Some private companies are often two steps ahead of the federal government on policy issues like privacy. Advanced technologies like artificial intelligence and machine learning are creating solutions, as well as problems, that most have never thought of before. Decisions made on one side of the globe quickly affect the other side.

“The world needs a new approach to public policy,” says Marquis. “We need new tools, new thinking, a new understanding of what it really takes to effect change. Pardee RAND is a small school, built on the strong foundation of RAND but not bound by the constraints of a big university. It has the freedom and flexibility to go first. And to lead the way.”
Pardee RAND is creating three new streams of study and action that better align with today’s policy needs. All of them will include ethics, communication, rigorous analytics, and bringing new perspectives into public policy.

**RESEARCH AND ANALYSIS**  The first stream draws on the school’s longtime strength and analytic foundation. Called “Research and Analysis,” it will continue to emphasize rigorous and sophisticated policy analysis. But it will also redefine the field to include more complex social and systemic problems, with a focus on designing policies, mechanisms, and actions for potential solutions.

The other two streams will be unlike anything the school has tried before.

**TECHNOLOGIST**  The “Technologist” stream will bring in computer scientists, software engineers, and other tech professionals to work at the intersection of technology and policy. Its centerpiece will be a physical Tech and Narrative Lab to push the limits of technology, from machine learning to virtual reality to digital gaming.

RAND researchers and Pardee RAND students will develop new applications and tools to solve problems, aspiring to capture some of the energy and innovation of Silicon Valley and Silicon Beach and apply it to making better policy and new solutions for the 21st century.

**POLICY IN ACTION**  The other new stream, “Policy in Action,” will focus on what it really takes to make change at street level. Pardee RAND plans to establish long-term relationships—ten years or more—with partner communities that don’t often get policy support to effect real and sustainable change.

Students, faculty, and RAND researchers will embed in those communities for months or even years, working with local leaders, local institutions, to solve local problems.

It’s policymaking up close, not just conducting a study or even a series of studies, but working with these communities to turn recommendations into action.

Public policy for the future

The other big change—an idea adapted from architecture schools—is that all Pardee RAND students, from the computer scientists to the community workers, will participate in policy-and-action design studios. Within them, students and, eventually, RAND researchers and other participants will gain a comprehensive understanding of seemingly intractable problems and the complex social system within which they exist. By understanding the problem as a whole, students and researchers will develop novel insights and tractable solutions.

Leveraging new tools for addressing complex problems, studio participants will “learn and do.”

With these structural changes and their emphasis on learning and doing, Pardee RAND will become the model for a new generation of public policy graduate schools. Leadership is committed to sharing what we learn with other policy schools, to work with them to change the very definition of public policy. It’s a field that has existed, more or less unchanged, for half a century, and it’s time to take that next step.
Degrees

The 2018 cohort arrived with degrees in a variety of disciplines, including:

- Applied Math
- Civil Engineering
- Computer Science
- Economics
- Energy Policy
- Health Informatics
- International Relations
- International Science and Technology Policy
- Medicine
- Neuroscience
- Operations Research
- Philosophy
- Physical Chemistry
- Political Economy
- Political Science
- Predictive Analytics
- Public Administration
- Public Policy

30% of the new cohort hails from outside the United States

7 countries of origin: China, India, Italy, Qatar, South Korea, Spain, and the United States

40% are women

85% hold advanced degrees, including the MA, MS, MBA, MPA, MPH, MPP, and MD.
The opioid crisis is a dynamic public health threat. Opioid use disorders affect an estimated nine out of every 1,000 Americans. The estimated economic burden of opioid abuse and overdose is staggering—nearly $500 billion annually, more than the government spends on health care for the poor each year. Successfully combating the crisis demands collaborative efforts to address the challenges to our public health, health care, public safety, law enforcement, and criminal justice systems.

The National Institute on Drug Abuse funded the RAND Opioid Policy Tools and Information Center to develop reliable data, rigorous methods, and policy tools to inform evidence-based opioid policy. The center will assess the opioid crisis as it continues to evolve, describe the policies being implemented to address it, identify the impact of alternative strategies taken by the state and federal government, and suggest policy approaches that have yet to be tried together as comprehensive strategies for improving public health and public safety.

The center is designed to be a national resource, fostering innovative and high-quality research in opioid policy science, and developing and disseminating methods, tools, and information to the research community, policymakers, and other stakeholders.

In addition to this new government-funded center, a new philanthropically funded RAND Venture called Stemming the Tide of the Opioid Crisis was launched in 2018. This venture will be the first to rigorously model the comprehensive opioid ecosystem and to delineate for decisionmakers how decisions and outcomes in one sphere reverberate across so many others.
$3 Million Gift Supports RAND’s Employee Recognition Program

RAND received a $3 million gift from former health care executive Leonard D. Schaeffer to help endow RAND’s employee recognition awards.

The RAND medal awards recognize individuals throughout the institution who have made exceptional and inspiring contributions to RAND’s mission and priorities. The top award, given annually to two individuals or employee groups, was renamed the Leonard Schaeffer Medal in recognition of the gift.

This year’s Schaeffer Medals were awarded to senior political scientist Jennifer Kavanagh, for coleading the Truth Decay initiative; and to senior behavioral scientist Andrew R. Morral and digital design and production manager Chara Williams, for their collaboration on a comprehensive online repository of current gun policy research, created as part of the Gun Policy in America initiative.

Schaeffer is a long-standing trustee and member of the RAND Health Board of Advisors. He previously made gifts to RAND in support of the Leonard Schaeffer RAND–USC Initiative in Health Policy and Economics, and the Comprehensive Assessment of Reform Efforts (COMPARE), a microsimulation model built by RAND researchers that predicts the effects of health policy changes at national and state levels.

“The quality of an organization’s staff is what sets it apart from its peers. At RAND, I’ve seen how skilled and dedicated RAND’s employees are at developing solutions to the most-significant challenges of our time,” Schaeffer said. “I’m pleased to help support a high bar of excellence among this high-achieving community.”

Schaeffer has endowed academic chairs in health policy and economics at the Brookings Institution, the National Academy of Medicine, Harvard Medical School, and the University of Southern California (USC). He is a professor at USC and a member of the National Academy of Medicine.
Truth Decay

RAND’s 2018 book *Truth Decay: An Initial Exploration of the Diminishing Role of Facts and Analysis in American Public Life* garnered significant attention. President Barack Obama put it on his summer reading list, describing it as “a look at how a selective sorting of facts and evidence isn’t just dishonest, but self-defeating to a society that has always worked best when reasoned debate and practical problem-solving thrive.” 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 has developed over decades and will take decades to undo.

The book was written by senior political scientist Jennifer Kavanagh and RAND president and CEO Michael D. Rich. Their research has positioned RAND as the authority on one of today’s most serious challenges and received widespread praise for being nonpartisan, objective, and rigorous. Kavanagh has briefed the analysis to influential policymakers and a wide array of stakeholders, and she received a Leonard Schaeffer Medal Award for coleading the project and being a compelling spokesperson for this first comprehensive analysis of an increasingly urgent issue.

In 2019 and 2020, RAND researchers will publish follow-on studies exploring approaches to countering disinformation, changes in media content over time, ways to develop more-effective media literacy programs, understanding and reducing cognitive biases, the state of civic education, and opportunities for rebuilding public trust in key institutions.
In 2018, RAND was selected to help oversee a philanthropic fund that will support high-quality research on issues related to gun violence.

The National Collaborative on Gun Violence Research is a creation of Houston-based Arnold Ventures, which has pledged $20 million to the effort and will seek an additional $30 million from other philanthropic groups.

“Over the next five years, the collaborative will fund projects on a range of topics concerning gun policy and gun violence reduction,” said Andrew Morral, the collaborative’s director. “These projects will be selected to provide information needed by policymakers to create fair and effective strategies for reducing gun violence.”

“Understandably, gun violence is a deeply emotional issue. But arguing about the proper response will not solve the problem. Our goal is to provide objective information to guide a rational, fact-based response to a national crisis,” said Laura Arnold, cochair of Arnold Ventures. “We need data, not politics or emotion, to drive our decisions.”

The National Collaborative on Gun Violence Research will oversee the selection of research topics and dissemination of key research findings to a wide variety of audiences.

RAND was chosen to help administer the National Collaborative on Gun Violence Research based on RAND’s deep technical knowledge of gun policy science and its ongoing Gun Policy in America initiative, a philanthropically funded RAND Venture designed to establish a shared set of facts on gun policy that will improve public discussions and support the development of fair and effective policies.
The National Science Foundation awarded RAND a $2.1 million grant to develop and demonstrate a novel approach to landslide warnings in Sitka, Alaska, where three people died in a 2015 slide. Researchers are using new, inexpensive sensors to monitor slope conditions around the coastal town of 9,000 residents. They also have enlisted the help of local “citizen scientists” to collect field data with an innovative app-based system.

A central question the team is trying to answer with the community is how to most effectively communicate risk without overburdening residents with false alarms. The project will help communities around the world better anticipate and prepare for landslides, which are difficult to predict because they are infrequent and depend on specific soil, rain, and wind conditions.

The RAND-led team includes the Sitka Sound Science Center, the University of Southern California, the University of Oregon, and the Sitka Tribe of Alaska. It is being led by Ryan Andrew Brown, codirector of the Center for Qualitative and Mixed Methods at RAND, and by Robert Lempert, director of the Frederick S. Pardee Center for Longer Range Global Policy and the Future Human Condition.

Lempert and other RAND researchers made earlier trips to Sitka under a yearlong planning grant from the National Science Foundation’s “Smart and Connected” communities program. They held public discussions with the Sitka community about how to communicate often-imperfect landslide risk information.

Now that funding for the full project has been approved, the researchers will undertake three to four years of collaborative work in Sitka with geoscientists, computer scientists, engineers, and education experts to improve the safety of people living with landslide risks.
Highlights from Capitol Hill

RAND informs policymakers with research and analysis that are relevant to current congressional agendas, providing knowledge that is trusted for its objectivity, comprehensiveness, and enduring value. 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 impact lives in positive and meaningful ways.

CONGRESSIONAL BRIEFINGS

RAND experts visit Capitol Hill to inform policymakers about research and analysis that are relevant to current legislative debates. Video and audio recordings of Hill briefings are available at www.rand.org/congress/activities.

Fixing What’s Broken with Infrastructure Policy: Options for Congress
Debra Knopman > January 24, 2018

Overcoming the Threats of Our Strategic Competitors
David Ochmanek > March 27, 2018

Protecting Consumer Data: Considerations for Congress
Rebecca Baibako and John Davis > June 8, 2018

The Russian Way of Warfare
Scott Boston and Dara Massicot > June 15, 2018

RAND Public Policy Workshop
Jeffrey Wasserman > August 21–22, 2018

CONGRESSIONAL TESTIMONY

RAND experts are frequently invited to testify before Congress. Testimonies are available at www.rand.org/testimony. Highlights from 2018 include the following:

Assessing North Korea’s Chemical and Biological Weapons Capabilities and Prioritizing Countermeasures
John V. Parachini > presented before the House Foreign Affairs Committee, Subcommittee on Terrorism, Nonproliferation and Trade, and the Subcommittee on Asia and the Pacific > January 17, 2018

Data Thieves: The Motivations of Cyber Threat Actors and Their Use and Monetization of Stolen Data
Lillian Ablon > presented before the House Financial Services Subcommittee on Terrorism and Illicit Finance > March 15, 2018

Five Options for Long-Term Sustainability and Viability of Pennsylvania’s State System Universities
Charles A. Goldman > presented before the Pennsylvania Legislative Budget and Finance Committee on April 25, 2018, and the Pennsylvania House and Senate Education Committees > April 30, 2018

Financing Early Learning in California
Lynn A. Karoly > presented before the Assembly Blue Ribbon Commission > May 3, 2018

The Challenges and the Benefits for U.S. National Security of Providing Foreign Assistance to Afghanistan
Laurel E. Miller > presented before the Senate Committee on Homeland Security & Governmental Affairs Subcommittee on Federal Spending Oversight and Emergency Management > May 9, 2016

Russian Nuclear Forces and Prospects for Arms Control
Austin Long > presented before the House Foreign Affairs Subcommittee on Terrorism, Nonproliferation, and Trade > June 21, 2018

Russian Social Media Influence: Understanding Russian Propaganda in Eastern Europe
Todd C. Helmus > presented before the Senate Select Committee on Intelligence > August 1, 2018

Evolution of the U.S. Overdose Crisis
Bryce Pardo > presented before the House Foreign Affairs Subcommittee on Africa, Global Health, Global Human Rights, and International Organizations > September 6, 2018

An Overview of Current Trends in Terrorism and Illicit Finance
Colin P. Clarke > presented before the House Financial Services Subcommittee on Terrorism and Illicit Finance > September 7, 2018

Leadership

OFFICE OF THE PRESIDENT
Michael D. Rich
President and Chief Executive Officer
Jennifer Gould
Chief of Staff

FINANCE
Mike Januzik
Vice President and Chief Financial Officer

GENERAL COUNSEL AND CORPORATE SECRETARY
Robert M. Case
Vice President, General Counsel, and Corporate Secretary

HUMAN RESOURCES
Allison Elder
Vice President

RESEARCH SERVICES AND OPERATIONS
Eric Peltz
Vice President

RESEARCH AND ANALYSIS
Andrew R. Hoehn
Senior Vice President, Research and Analysis

RESEARCH DIVISIONS
RAND Arroyo Center
(Soldier Research Division)
Sally Sleeper
Vice President and Director

RAND Education and Labor
V. Darleen Opfer
Vice President and Director

RAND Health Care
Peter S. Hussey
Vice President and Director

RAND Homeland Security
Research Division
Terrence K. Kelly
Vice President and Director, Homeland Security
Operational Analysis Center

RAND National Security
Research Division
K. Jack Riley
Vice President and Director, RAND National Defense
Research Institute

RAND Project AIR FORCE
Ted Harshberger
Vice President and Director

RAND Social and Economic Well-Being
Anita Chandra
Vice President and Director

RESEARCH DEPARTMENTS
Melissa Rowe
Vice President, Global Research Talent

Behavioral and Policy Sciences
Jennifer Sloan McCombs
Director

Defense and Political Sciences
Thomas S. Szayna
Director

Economics, Sociology, and Statistics
Jennie W. Wenger
Director

Engineering and Applied Sciences
Christopher G. Pernin
Director

PARDEE RAND GRADUATE SCHOOL
Susan L. Marquis
Dean, Pardee RAND Graduate School
Vice President, Innovation

INTERNATIONAL
Charles P. Ries
Vice President, International

Hans Pung
President, RAND Europe

Carl Rhodes
Director, RAND Australia

EXTERNAL AFFAIRS
Winfield A. Boerckel
Vice President

DEVELOPMENT
Brandon Baker
Vice President

As of March 2019
NEW VICE PRESIDENTS AT RAND

Brandon Baker joined RAND’s leadership team as vice president of development. Baker previously served as assistant dean of external affairs at the UCLA Samueli School of Engineering. He and his team were responsible for a $250 million goal as part of the school’s campaign, a component of UCLA’s $4.2 billion effort. “Brandon brings impressive expertise, creativity, and a strong track record of garnering philanthropic support to bring transformative ideas to life,” said Michael Rich, RAND’s president and CEO. Baker has more than a decade of experience in both public and private higher education institutions. He also served as a development director at Villanova University and Columbia University Graduate Business School.

Anita Chandra is vice president and director of RAND Social and Economic Well-Being. This research division tackles cross-cutting, systemic issues, such as global and local governance, the changing role of civil society, the policy implications of regulation versus deregulation, and new frontiers in localism and regionalism, and is committed to the ultimate goal of building safe, healthy, and thriving communities throughout the world. Throughout her career, Chandra has engaged government and nongovernmental partners to consider cross-sector solutions for improving community well-being and to build more robust systems and evaluation capacity. Chandra earned a Dr.P.H. in population and family health sciences from the Johns Hopkins Bloomberg School of Public Health.

Robert M. Case was appointed vice president, general counsel, and corporate secretary. Case had previously served as RAND’s associate general counsel from 2013 to 2015. Case has nearly two decades of legal experience, with specialties in government contracts and grants, commercial contracts, intellectual property rights and licensing, regulatory compliance, employment law, and litigation. Before rejoining RAND, he served as senior vice president and general counsel at ASRC Industrial Services, a diversified environmental, industrial, and commercial services provider. Case earned his law degree from the UC Hastings College of the Law.
Peter S. Hussey is vice president and director of RAND Health Care, a research division at RAND that promotes healthier societies by improving health care systems in the United States and other countries. RAND Health Care provides health care decisionmakers, practitioners, and the public with actionable, rigorous, objective evidence to support their most complex decisions. Hussey’s research focuses on innovations in health care payment and delivery. Prior to joining RAND, Hussey worked at the Organisation for Economic Co-operation and Development in Paris, France. He received his Ph.D. in health policy and management from the Johns Hopkins Bloomberg School of Public Health.

Terrence K. Kelly is vice president and director of the Homeland Security Operational Analysis Center (HSOAC) and of the RAND Homeland Security Research Division. Since Kelly was appointed HSOAC’s inaugural director in September 2016, the center has evolved from a startup research unit to RAND’s fastest-growing division. Kelly is a retired Army officer who has served in operational units as well as in the Pentagon, State Department, Commerce Department, and the White House. He has a Ph.D. in mathematics and an M.S. in computer and systems engineering from Rensselaer Polytechnic Institute, as well as an M.S.S. in strategic studies from the Army War College. He is a graduate of the United States Military Academy.
**V. Darleen Opfer** is vice president and director of RAND Education and Labor. This research division delivers analysis and recommendations to inform the policies and practices that support learning; improve school effectiveness; enhance labor market outcomes; foster sound financial decisionmaking; and promote individuals’ workforce competitiveness, well-being, and engagement as citizens. Prior to joining RAND in 2011, she was director of research and senior lecturer in research methods and school improvement at the University of Cambridge Faculty of Education in England. She has conducted policy research studies for local, state, and national governments on issues that affect teachers and schools, including recruitment and retention, professional development, and impact of policies on teacher practice. Opfer holds a Ph.D. in education policy studies from the University of Virginia.

**Sally Sleeper** is vice president and director of the Army Research Division at RAND, which houses Arroyo Center, the U.S. Army’s sole federally funded research and development center for studies and analysis. Arroyo’s mission is to conduct objective analytic research on major policy concerns, with an emphasis on mid- to long-term policy issues; help the Army improve effectiveness and efficiency; provide short-term assistance on urgent problems; and be a catalyst for needed change. Sleeper, a senior management scientist, most recently served as director of Arroyo’s Strategy, Doctrine, and Resources Program. She received her Ph.D. in organization science and economics from Carnegie Mellon University.
Dr. Vivek H. Murthy, 19th Surgeon General of the United States, was elected to the Board of Trustees in September 2018. During his term as surgeon general, he published the first Surgeon General’s Report on Alcohol, Drugs, and Health, which placed drug and alcohol addiction alongside smoking, AIDS, and other public health crises of the past 50 years. It presented a vision for a comprehensive, effective, and humane public health approach to addressing addiction. As the Vice Admiral of the U.S. Public Health Service Commissioned Corps, he also oversaw a uniformed service of 6,700 public health officers, serving the most vulnerable populations domestically and abroad. Murthy received his B.A. from Harvard and his M.D. and M.B.A. degrees from Yale. He completed his internal medicine residency at Brigham and Women’s Hospital in Boston and later joined Harvard Medical School as faculty in internal medicine.
Members of RAND advisory boards support RAND and enrich our research initiatives by adding their diverse experience, perspective, and knowledge to our efforts to improve public policy. Our advisory boards include distinguished individuals who have demonstrated leadership and a commitment to transcending political partisanship and ideologies.
INTERNATIONAL

RAND Europe is an independent, not-for-profit subsidiary of the RAND Corporation, with offices in Cambridge, United Kingdom, and Brussels, Belgium. RAND Australia is located in Canberra, Australia.

RAND Europe Council of Advisors

Michael D. Rich (Chair)
Paul Adamson OBE
László Andor
Dawn Austwick
Carl Bildt
Dame Carol Black DBE, FRCP, FMedSci
Philippa Foster Back CBE
Máire Geoghegan-Quinn
Florian Freiherr von Heintze
Susan Hitch
Michael Hoffman
David Howarth
Gunvor Kronman
Sir Tom Phillips KCMG
Gill Samuels CBE
Sir Gregory Winter CBE FRS

Emeritus
Sir John Boyd KCMG

As of December 2018

OVERSIGHT BOARDS

These are the oversight boards for two of the federally funded research and development centers (FFRDCs) at RAND that are sponsored by the U.S. Department of Defense. FFRDCs are nonprofit entities that assist the U.S. government with scientific research, analysis, and development.

RAND Australia Advisory Board

Richard C. Smith AO, PSM (Chair)
Jeffrey L. Bleich
Hugh Morgan AC
Heather Ridout AO
Phillip Scanlan AM
Robyn Ward AM

As of December 2018

U.S. Army Arroyo Center Policy Committee

GEN James C. McConville (Cochair)
Bruce D. Jette (Cochair)
John E. Whitley
R. D. James
Jordan Gillis
LTG Thomas C. Seamands
LTG Scott D. Berrier
LTG Joseph Anderson
LTG Aundre F. Piggee
LTG James F. Pasquarette
LTG Nadja Y. West
LTG Gwendolyn Bingham
LTG Bruce T. Crawford
MG David P. Giaser
LTG Charles D. Luckey
LTG Timothy J. Kadavy
GEN Stephen J. Townsend
GEN Gustav F. Perna
LTG Francis M. Beaudette
LTG James H. Dickinson
LTG Stephen G. Fogarty
MG John G. Ferrari (Lead Agent)

As of December 2018

USAF Project AIR FORCE Steering Group

Gen Stephen W. Wilson
Lt Gen Jacqueline D. Van Ovost
Lt Gen Brian T. Kelly
Lt Gen Veralinn Jamieson
Lt Gen Mark D. Kelly
Lt Gen Warren D. Berry
Lt Gen Timothy G. Fay
Lt Gen Jerry D. Harris Jr.
Kevin E. Williams
Lt Gen Richard M. Clark
Lt Gen Dorothy A. Hogg
Darlene J. Costello
Lt Gen Arnold W. Bunch Jr.
Heidi H. Grant
Daniel R. Sitterly
Mark A. Gallagher

As of December 2018
Fueled by philanthropic gifts from individuals, foundations, and private-sector firms plus earnings from RAND’s endowment and operations, RAND Ventures is an important way to pursue visionary ideas; address critical problems that are under-researched; shape emerging policy debates; and devise innovative approaches for solving acute, complex, or provocative policy challenges.

RAND Ventures is like a research and development lab—essential to our ability to gaze over the horizon, beyond the constraints of many of today’s decisionmakers, to imagine, prepare for, and enable what’s next.

The RAND Ventures program helps RAND support vital research pursuits and outreach activities that would otherwise go unfunded. Our donors share RAND’s commitment to quality and objectivity; entrust us with protecting these values in our work; and help RAND have an impact across the national and global policy landscape.

To learn more about RAND Ventures, visit www.rand.org/giving/ventures.

RAND gratefully acknowledges gifts made by the following donors in 2018.

**$1,000,000+**
Jim and Anahita Lovelace
Frederick S. Pardee
Leonard D. Schaeffer

**$500,000–$999,999**
Marcia and Frank C. Carlucci
Epstein Family Foundation
Diane P. and Guilford Glazer Fund

**$100,000–$499,999**
Robert J. Abernethy
Allstate Insurance Company
Harold and Colene Brown
Lovida H. Coleman, Jr./William T. Coleman, Jr.
Jacques E. and Carine Dubois
Ellen M. Hancock
Joel Hyatt
Peter Lowy
Susan F. and Donald B. Rice
State Farm Insurance
Frederick Morgan Taylor
Y&S Nazarian Family Foundation
Charles J. Zwick

**$50,000–$99,999**
Anonymous (4)
ABN Amro Incorporated
American Arbitration Association
American International Group, Inc.
Brent and Linda Bradley
Burford Capital
Ciervo Foundation
CNA Insurance Companies
Culver Studios Owner LLC
ExxonMobil Corporation
The Rosalinde and Arthur Gilbert Foundation
Michal Grayevsky
The Home Depot, Inc.
Susan and Tod Hullin
Donald M. James Family Foundation
JAMS

**$25,000–$49,999**
Anonymous (4)
ABN Amro Incorporated
American Arbitration Association
Bank of America
Araceli and David Barclay
William Benz
Chris Brothers
Elizabeth J. Cabraser
Cedars-Sinai Health System
Chertoff Group, Chad Sweet
Chevron
Frank M. Clark
The Coca-Cola Company
Michael J. Critelli
Scott DePasquale
The Doctors Company
William A. Downe
Tom Epley and Linnae Anderson
EQT Foundation
Eversheds Sutherland
Kenneth R. Feinberg
Adam Flatto
Florida Blue Foundation
Marilyn and Robert Funari Family Foundation
Matthew Garrettson
Geisinger System Services, David T. Feinberg
General Electric Company
Patrick J. Geraghty
President's Council

The RAND President's Council is a leadership group of individuals who make significant contributions to support the mission of RAND and the efforts of its president and CEO to increase the impact and influence of RAND’s research and analysis on public policy. Members are part of a cabinet that provides philanthropic support and advice to RAND’s president and CEO to strengthen RAND’s capacity to conduct research, analysis, and public engagement that help policymakers address the world’s most important challenges. The President’s Council consists of the following major donors.

Robert J. Abernethy
Marcia Carlucci
Jacques E. Dubois
Daniel J. Epstein
Rita E. Hauser
Joel Hyatt
Jim Lovelace
Peter Lowy
Frederick S. Pardee
Donald B. Rice
Susan F. Rice
Leonard D. Schaeffer
Michael Tang

Nancy and Angus Robertson
Stephen G. Robinson
James E. and Sharon C. Rohr
Mr. and Mrs. Louis N. Rowell
Margaret E. Schumacher
Nancy and William Scott
Segal Family–United World Foundation
Mrs. Donald Seldin
Pamela K. Severson
Shirley and Ralph Shapiro
George P. Shultz
The Sikand Foundation
R. P. Simmons Family Foundation
Victoria Simon
Lynne Slattery
Lois Slavkin, M.A.
Roberta J. Smith, Matrix Planning, Inc.
Jed C. Snyder
Janet Spinks
Darlene and James A. Thomson
Ken and Julie Thorpe
Mr. and Mrs. Michael Traynor
Wesley and Marianne Truitt
Zac Turke
Jack Ubinge
Marsha Vande Berg
Winnie Wechsler and Jeffrey Wasserman
Marianne Weil
Dr. and Mrs. Duane E. Wikholm
Phyllis M. Wise
WizeHire, Inc
Tim Wolf, President, Wolf Interests
LTC Robert Wolff, Ph.D.
USA (Ret.)
Linda Tsao Yang

In Honor
Natalie Crawford
Lynn E. Davis
Allison Elder
Karen Hein
Brian Michael Jenkins
Jennifer Kavanagh
Arthur and Rini Kraus
Joseph P. Newhouse
Michael Rich
Margaret E. Schumacher

In Memory
Frank Carlucci
Lovida Coleman
Steve Dreznner
John W. Ellis, Jr.
Everyone who has been a victim of gun violence
Billie L. Fenton
Mike Hix
Fred Hoffman
Victor G. Jackson
Dr. William Kolb
Steven Lazarus
Steven Levine
Kevin N. Lewis
Nancy Nimitz
Donald Palmer
Robert Perry
Dr. Wesley Wentz Posvar
Barbara Quint
David Richards
Donald Seldin
Donald Stevens
Rachel Uzan
Susan Way-Smith
Charles Zwick
Warfare in the future will increasingly be about manipulating perceptions, whether by hostile states or nonstate actors, according to terrorism expert Brian Michael Jenkins. The creation of fear and anxiety by terrorists and foreign meddling in U.S. politics are components of contemporary conflict. A major challenge facing the United States is how to get better at countering foes while strengthening national institutions, and U.S. democracy depends on it, Jenkins said at RAND’s annual fundraising event, One Night with RAND.

Jenkins, senior adviser to the president of RAND, is regarded as a leading authority on terrorism and initiated RAND’s research on terrorism in the early 1970s. In addition to Jenkins, several other terrorism researchers spoke at the event about changing tactics and strategies for countering terrorism in the future.

“Neither border walls nor firewalls can protect a divided society that dismisses fact and submits to the tyranny of fear,” Jenkins said. “Our defense must come from all of us—all of us as Americans—not just the Departments of Defense or Homeland Security. A nation united in its commitment to fundamental values—liberty, courage, self-reliance, sense of community, and mutual respect—cannot be sundered, cannot be conquered.”

The event brought together leaders in business, government, academia, and philanthropy to pay tribute to Jenkins and mark his 50-year affiliation with RAND and the substantial body of research on terrorism that he has produced.
9 Locations
RAND’s North American locations include Santa Monica, California, the home of its headquarters campus and the Pardee RAND Graduate School; Arlington, Virginia; Pittsburgh, Pennsylvania; and Boston, Massachusetts. The RAND Gulf States Policy Institute is in New Orleans, Louisiana. Our newest office is in the San Francisco Bay Area. RAND Europe is located in Cambridge, United Kingdom, and Brussels, Belgium. RAND Australia is located in Canberra.

50 Countries
RAND attracts top talent from more than four dozen nations.

1,950 Staff
Our people bring a diverse range of professional, educational, and cultural backgrounds to their project teams.

54% Hold Doctorates
Well over half our research staff of ~1,200 hold one or more doctorates in an array of disciplines.

75 Languages
Many of our staff are multilingual. Languages spoken include Arabic, Chinese, Farsi, French, German, Japanese, Korean, Russian, and Spanish.

Research Talent

By the Numbers 2018
875 Publications
Last year, we added ~500 RAND publications and ~375 journal articles to our growing digital library—24,000 and counting—of reports, podcasts, videos, and commentary, which can be read or downloaded at www.rand.org.

685+ New Projects
Through more than 1,780 projects (including ~685 new ones), RAND provides research services, systematic analysis, and innovative thinking to a global clientele.

385 Clients and Grantors
We performed work for more than 385 clients and grantors, including government agencies, international organizations, and foundations.

690 Donors
Gifts from donors help RAND deliver fact-based, actionable solutions grounded in rigorous analysis. They help fund our people, ideas, centers of excellence, and outreach.

5.4M Web Downloads
Through more than 1,780 projects (including ~685 new ones), RAND provides research services, systematic analysis, and innovative thinking to a global clientele.

170K+ Twitter Followers
Last year, we added ~500 RAND publications and ~375 journal articles to our growing digital library—24,000 and counting—of reports, podcasts, videos, and commentary, which can be read or downloaded at www.rand.org.

Revenue and Expenses

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Air Force</td>
<td>$49.3M</td>
</tr>
<tr>
<td>U.S. Army</td>
<td>$40.5M</td>
</tr>
<tr>
<td>U.S. Department of Health and Human Services and related agencies</td>
<td>$68.9M</td>
</tr>
<tr>
<td>U.S. Department of Homeland Security</td>
<td>$46.2M</td>
</tr>
<tr>
<td>Other</td>
<td>$2.3M</td>
</tr>
<tr>
<td>Private sector</td>
<td>$3.3M</td>
</tr>
<tr>
<td>Philanthropic contributions</td>
<td>$10.9M</td>
</tr>
<tr>
<td>Foundations</td>
<td>$18.9M</td>
</tr>
<tr>
<td>Other nonprofit organizations</td>
<td>$5.1M</td>
</tr>
<tr>
<td>Universities</td>
<td>$0.8M</td>
</tr>
<tr>
<td>Non-U.S. government agencies and international nongovernmental organizations</td>
<td>$16.2M</td>
</tr>
<tr>
<td>State and local government agencies</td>
<td>$5.2M</td>
</tr>
<tr>
<td>Other federal agencies</td>
<td>$15.4M</td>
</tr>
<tr>
<td>Office of the U.S. Secretary of Defense and other national security agencies</td>
<td>$61.8M</td>
</tr>
</tbody>
</table>

76% Research and analysis

875, 685+, 385, 690, 5.4M, 170K+ Facts Forward > By the Numbers

$345M in revenue
FY2018, net of subcontracts and RAND-initiated research

A complete copy of RAND’s financial statements can be found at www.rand.org/about/financial_statements
Gabonese and U.S. paratroopers completed two multinational jumps into Pointe Denis landing zone during United States Army Africa’s Central Accord 2016 in Libreville, Gabon.

p. 36

Associated Press / Gerald Herbert
pp. 5 (excerpt), 14

Associated Press / Lenny Ignelzi
pp. 5 (excerpt), 19

Associated Press / Imaginechina via AP Images / Li jianbo
J-10A fighter jets, 12th China International Aviation and Aerospace Exhibition, also known as Airshow China 2018, in Zhuhai city, November 2018.

pp. 5 (excerpt), 35

Associated Press / Mark Lennihan
A security camera is mounted on the side of a building overlooking an intersection of midtown Manhattan.

p. 40

Associated Press / Dennis M. Rivera
pp. 5 (excerpt), 25

Associated Press / The Vicksburg Evening Post, David Jackson
p. 22

Associated Press / Ahn Young-joon
South Korean calligraphist Yeo Tae-myong writes on the unification flag to celebrate a 2018 inter-Korean summit in Seoul. His work reads “Unification of North and South Korea.”

p. 30

Diane Baldwin
pp. 2, 6, 9, 11, 18, 21, 26, 28, 31, 33, 34, 37, 39, 40 (bottom), 43, 45, 48, 49, 50, 52, 55, 61, 62, 63 (top), 71

Benny Chan / Fotoworks
p. 48

Grace Evans
pp. 59, 63 (bottom)

Elizabeth Iredale
p. 12

Francisco Kjolseth / The Salt Lake Tribune via AP
p. 44

Douglas Miles / Why We Rise
p. 7

Chris Philpot
pp. 50–51 (illustrations)

Michael Ray Photography
pp. 15, 17

Reuters / Ibraheem Abu Mustafa
pp. 5 (excerpt), 27

Karen Sayre
pp. 23, 24

Christoph Soeder / picture-alliance / dpa / AP Images
pp. 5 (excerpt), 32

Peter Soriano
p. 56

Sputnik via AP
pp. 5 (excerpt), 28

U.S. Department of Health and Human Services
p. 64

U.S. Air Force / Senior Airman Bobby Cummings
pp. 5 (excerpt), 42

Chara Williams
p. 57