A MESSAGE FROM THE PRESIDENT AND CEO

2021

Year in Review

RAND is an institution with impact at its core. Our purpose is to help ensure that the most important decisions are made on the basis of the best-possible evidence. We achieve this through a special combination of rigorous, objective research and analysis and thoughtful, nonpartisan engagement—with decisionmakers at all levels and the public more broadly.

Our dedication to making an impact is what inspired me and other colleagues nearly a quarter century ago to devise a test for mission success and to diligently apply it and share the results ever since. This process of annual reflection is an important way we hold ourselves accountable for making a difference.

RAND’s test for impact has three tiers; each tier requires more from us than the previous one:

**TIER 1**
The research and analysis **address issues at or near the top of the policy agenda** or help shape that agenda.

**TIER 2**
The results **reach key decisionmakers and the broader public**, improving the quality of policy discussions and deliberations.

**TIER 3**
The findings and recommendations **lead directly to improvements in policy and decisionmaking**.

This Year in Review profiles inspiring examples of RAND research achieving Tier 3 impact. I am grateful, as always, to all my talented RAND colleagues throughout our institution, whose teamwork, innovation, and commitment make these accomplishments possible, as well as to our clients, grantors, and donors, who look to RAND for evidence to guide them in addressing their most consequential and complex challenges.

Michael D. Rich
President and CEO
ENSURING EQUITABLE ACCESS TO HEALTH CARE

Policies backed by RAND research are changing health care delivery in ways that benefit all of society.

The Price of Hospital Stays

RAND research showing that employer-funded health plans often pay 250 percent of what Medicare pays for the same care spurred large Colorado corporations, with the support of the state government, to create a purchasing group that allows them to negotiate prices directly with hospitals for common procedures. In Fort Wayne, Indiana, where RAND found some of the highest hospital costs relative to Medicare in the country, employers used the data to push the market’s main insurer to renegotiate prices. Since 2017, RAND researchers have been collecting and analyzing an expanding set of data on what hospitals charge private insurance, as well as how those costs compare with Medicare payment rates across the United States. The research highlighted two key policy options to lower these costs: greater hospital pricing transparency and mechanisms to set limits on what hospitals can charge relative to Medicare rates. The findings informed a 2020 U.S. Department of Health and Human Services rule requiring greater hospital price transparency, and efforts are underway in California, Wisconsin, and Illinois to give employer-payers more bargaining power. Ninety-five percent of Americans with private health insurance are covered through their employers, and hospital care accounts for one-third of health expenditures. The research showed that capping prices at no more than 150 percent of Medicare rates nationwide could save $62 billion to $237 billion annually.

COVID-19 Vaccines for Adolescents

U.S. officials had a head start in addressing the concerns of adolescents and their parents about COVID-19 vaccination thanks to one in a series of rapid-response surveys by a team that included RAND researchers. In May, the U.S. Food and Drug Administration expanded its emergency use authorization for the Pfizer-BioNTech COVID-19 vaccine to include 12- to 15-year-olds. RAND is a partner in the Health-care and Public Perceptions
of Immunizations Survey Collaborative—along with the U.S. Centers for Disease Control and Prevention (CDC) and the University of Iowa. The survey data were presented at several meetings of the CDC’s Advisory Committee on Immunization Practices, which issues recommendations and public health guidance for vaccine use in the United States.

The findings provided a valuable and timely snapshot of attitudes toward vaccines for children, adolescents, and adults and showed that the primary way to increase acceptance, especially among adolescents and their parents, would be to provide more information about the vaccine’s safety and efficacy.

**Telehealth for Vulnerable Populations**

As a result of RAND researchers’ recommendations, new federal guidelines are standardizing telehealth treatment and promoting equitable care for high-risk and underserved populations in the United States. Video and telephone visits can expand access to health care for people who have work and child care responsibilities or lack transportation. However, when the COVID-19 pandemic began, providers did not always have the guidance they needed to deliver care this way.

At the start of the pandemic, RAND researchers quickly mobilized to study telehealth’s uptake, costs, and outcomes, finding that use increased across all types of providers but that telehealth was offered inconsistently to patients. Concerned about costs, the U.S. Centers for Medicare and Medicaid Services and other payers indicated that they might cease to offer these appointments altogether when the pandemic ended.

The U.S. Substance Abuse and Mental Health Services Administration acted on the RAND team’s recommendations to develop new evidence-based guidelines for
integrating telehealth into the treatment of major mental illness and substance-use disorders, potentially benefiting millions of Americans with these conditions. To continue meeting the needs of low-income patients while keeping costs affordable, the federal Medicare Payment Advisory Commission used RAND’s findings to create guardrails that could lead to a permanent telehealth expansion for beneficiaries. California has followed suit, with RAND recommendations guiding a recent major expansion of audio-only telehealth. Legislation has also been introduced in both the House and the Senate to ensure that telehealth remains widely available to patients after the pandemic ends.

Standards for High-Quality End-of-Life Care

RAND-developed standards for high-quality hospice and palliative care are ensuring that providers take a patient-centered approach to treatment decisions. The goal of hospice and palliative care is to help patients manage their pain and have the best quality of life possible—and it is important to prioritize patients’ treatment preferences. As part of a larger project for the Centers for Medicare and Medicaid Services, RAND researchers collaborated with palliative care providers, patient advocacy groups, and other stakeholders to develop and pilot two quality measures with patients who were receiving palliative care for serious chronic illnesses. The measures were designed to assess (1) the extent to which patients felt heard and understood by their palliative care providers and (2) whether patients received the care they wanted. The team then rolled out a robust nationally representative beta test to confirm the measures’ utility in assessing care quality, their feasibility for use by palliative care programs, and their validity and reliability across diverse patient populations. The American Academy of Hospice and Palliative Medicine has issued a formal recommendation for hospice, palliative care, and other providers nationwide to use the measures to standardize and improve end-of-life care for their patients.
SUPPORTING RESILIENT AND SUSTAINABLE COMMUNITIES

As communities look ahead to future challenges, RAND research is providing evidence-driven solutions that empower current and future generations and show how investments in resilience and sustainability can pay off in the long term.

Organized Crime and European Economies

Major organized crime networks in the European Union generated revenues of €139 billion in 2019 across nine illicit markets—equivalent to 1 percent of the European Union’s GDP, according to RAND Europe research cited in a new European Commission strategy. The secrecy around organized crime makes it inherently difficult to study, but the RAND Europe team, leading a consortium of research organizations, developed new estimates of the revenues from organized criminal activity across the European Union and investigated the future trends in lucrative criminal enterprises, such as drug trafficking. The study also traced the latest methods that criminal organizations rely on to transfer and launder money, including the use of cryptocurrencies and investments in legitimate businesses in the real estate, construction, transportation, and hospitality sectors.

The European Commission used the findings to develop its five-year strategy to combat organized crime, a strategy that focuses on disrupting criminals’ business models both online and offline to limit damage to the legal economy. The strategy calls for increased investments in digital tools to aid investigations, crack down on money laundering and other criminal financing mechanisms, and more effective information exchange among the sectors at risk of being infiltrated by organized crime groups. Preventing organized criminals from infiltrating legal enterprises will protect the livelihoods of law-abiding citizens while preventing billions of euros from being siphoned from national economies.
After a year and a half of pandemic-related disruptions, parents and educators are concerned about learning loss and the lifelong effects on K–12 students. Drawing on findings from a decade of research, a RAND team developed a practice guide to help schools make use of the 2021 summer months to counter the accumulated effects of the pandemic on children’s education. The guidance was subsequently adopted by districts across the United States to help students make up for lost time.

In addition to early planning, the researchers recommended establishing a set curriculum to ease the burden on teachers. Researchers also provided example plans, including activities, and quantified the amount of class time needed to combat learning loss. The U.S. Department of Education, informed by RAND research on the effectiveness of summer learning programs, encouraged policymakers to allocate Elementary and Secondary School Emergency Relief Fund awards for this purpose. The RAND guidance was also cited in materials produced by a dozen state departments of education. When Texas established its fund to support summer learning programs, districts’ eligibility was determined by their adherence to best practices and recommendations from RAND’s research. More than 100 Texas school districts received funding in summer 2021, giving the state’s children an opportunity to make up for pandemic-related learning loss.
Costa Rica’s Net-Zero Carbon Future

Climate change is a thorny problem for governments around the world, but, with the help of RAND researchers, Costa Rica is becoming a model for what a net-zero carbon future could look like. The prospect of a large up-front investment to achieve uncertain savings down the road puts policymakers in the difficult position of balancing near-term economic priorities with long-term sustainability—and another hitch is that halting climate change requires global participation. Costa Rica’s National Decarbonization Plan was ambitious, but it still attracted international investors. The RAND team, in collaboration with the University of Costa Rica, the Costa Rican government, and the Inter-American Development Bank, modeled more than 3,000 possible futures and found that the plan led to economic benefits in all but 22. And those economic benefits were significant: The analysis showed that the plan would cost around $37 billion to implement but that Costa Rica stood to gain $78 billion in savings and benefits over 30 years. Encouraged by the results of the RAND models, the government secured financing to construct a new electric rail system and, in the meantime, has replaced its existing fleet of antiquated trains with lower-emission diesel versions.

The Intergovernmental Panel on Climate Change—which counts RAND researchers among its members—has warned that the worldwide average temperature is on track to increase by more than 2 degrees Celsius by the end of the century without immediate and dramatic cuts in carbon emissions. A small state like Costa Rica is an ideal proving ground for innovative solutions that can preserve the health of local communities and their economies.
STRENGTHENING NATIONAL SECURITY

RAND’s expertise and decades-long relationships with senior military leaders have positioned it as a trusted source of objective recommendations to ensure a ready force and a safer world. Recent RAND research has guided policies in areas such as securing supply chains, protecting and retaining talented personnel, building long-term security partnerships, and leveraging commercial innovations in space.

Military Supply Chains

The COVID-19 pandemic affected supply chains for products ranging from household appliances to critical parts for military weapon systems. With national security and billions of dollars at stake, military supply chains must be agile and resilient, but RAND research has shown that it takes a whole-of-government effort and healthy partnerships with the private sector to manage the risk of disruptions and shortages in a global economy—and the United States, the United Kingdom, and Australia are taking note. The RAND National Security Supply Chain Institute was established in 2021 to bring together multiple research streams and support the United States and its allies in improving the robustness and responsiveness of their national security supply chains.

In July, the U.S. House Armed Services Committee’s Defense Critical Supply Chain Task Force called out opportunities to mitigate sources of military supply chain risk identified in a RAND study for the U.S. Air Force, including developing a risk assessment framework across the U.S. Department of Defense (DoD) and connecting disparate data sets. The RAND team relied on sophisticated analytic tools to untangle the “Gordian knot” of U.S. military supply chains, and the task force recommended that DoD adopt similar capabilities to identify and flag risks early in the acquisition process.

The United Kingdom is grappling with similar military supply chain challenges, and the Ministry of Defence turned to RAND Europe to support its plans to boost supply chain productivity and competitiveness. RAND Europe researchers devised a plan to cultivate trusted suppliers by helping small companies grow, innovate, and become midtier suppliers. The ministry established the Defence Supply Chain Development and Innovation Programme and committed to a multiyear investment of...
£40 million—which aligned with the research team's cost analysis. The next step is to roll out a pilot based on the RAND design that will demonstrate the program's potential to boost productivity and increase the resilience of the country's defense industrial base.

In March, Australia accelerated its timeline to increase its self-reliance in guided weapon system production and sustainment. The A$70 billion project, being developed in consultation with RAND Australia, is establishing a resilient domestic manufacturing enterprise as part of a larger framework that will give Australia greater control over each step in the weapon system life cycle—from research and development to disposal. The government expects the program to create more than 2,000 jobs and additional growth opportunities for Australian small businesses.

### Sexual Assault, Sexual Harassment, and Gender Discrimination Prevention Across the Force

The Independent Review Commission on Sexual Assault in the Military adopted a RAND research team’s recommendations for DoD to elevate sexual harassment as a priority for intervention and to address sexual assault, harassment, and discrimination against sexual minorities. Convened in January at the direction of President Biden and Secretary of Defense Austin, the commission cited in its report recent RAND findings that experiencing sexual harassment significantly increases the risk of sexual assault and that, although only 12 percent of the force identifies as “other than heterosexual,” these service members account for 43 percent of those who are sexually assaulted. RAND research, including findings about sexual assault risk at specific military installations, also came up frequently in a July hearing on the commission’s recommendations before the House Armed Services Subcommittee on Military Personnel.

In September, DoD announced its road map for implementing the commission’s recommendations and required the military services and components to submit initial implementation plans and resource requirements by mid-November. RAND researchers briefed Army leadership in preparation for this deadline. The Army has implemented an additional RAND recommendation to ensure the continuity of its initiatives when there is a change in command.
This research builds on nearly a decade of RAND analyses for DoD on sexual assault, sexual harassment, and gender discrimination across the force. These changes not only are enhancing the safety and well-being of individual service members but will also improve force readiness. As the Independent Review Commission noted, RAND research has found that the U.S. military loses at least 16,000 man-power years to sexual assault and sexual harassment annually.

**Global Security Partnerships**

RAND research has been influencing legislative debate and military leaders’ thinking on security cooperation to help the United States build strong global alliances and partnerships. The National Defense Authorization Act for FY 2017 called for the professionalization of the U.S. military’s security cooperation workforce. In response, the Defense Security Cooperation Agency established a new certification program and turned to RAND for help in identifying requirements and developing a training course for security cooperation professionals. The study’s findings and recommendations convinced the agency to make a major modification to the program in 2021, better preparing nearly 20,000 personnel for their role in enhancing the country’s national security posture.

RAND researchers also conducted a tabletop exercise with military leaders and security cooperation
professionals on U.S. approaches to global security partnerships. The Office of the Deputy Assistant Secretary of Defense for Security Cooperation is using lessons from the exercise to enhance U.S. alliances and partnerships in Oceania, with a focus on improving interagency coordination and multinational interoperability.

**Inclusivity in the U.S. Coast Guard**

The National Defense Authorization Act for FY 2021 directed the U.S. Coast Guard to report on efforts to increase the diversity of its force—influenced by RAND research findings showing that women leave active-duty service at significantly higher rates than men. To further support the Coast Guard in building a more diverse and inclusive force, RAND researchers conducted a follow-on study exploring the reasons for underrepresentation among women and racial/ethnic minorities in the active-duty Coast Guard. They mapped career trajectories and identified disparities in accession, career development, advancement and promotion, and retention that resulted in lower representation in senior leadership roles for women and racial/ethnic minorities. The researchers also conducted a survey and focus groups to solicit the views of personnel on the Coast Guard’s work climate.

At a June hearing before the House Committee on Homeland Security, the Commandant of the Coast Guard shared the progress that the service had made to date in adopting RAND’s recommendations to better support the women in its ranks. The Coast Guard has also established a task force to implement all 40 recommendations from the follow-on study, which addressed (1) leadership accountability, (2) data-enabled career management, (3) outreach and recruiting, (4) targeted programs to develop the careers of underrepresented personnel, and (5) steps to foster a more inclusive culture.

**Commercial Space Technologies and the Military**

Guided by RAND recommendations, the U.S. Space Force is translating innovative commercial technologies to real-world military applications. RAND researchers conducted an exhaustive systems engineering and threat assessment, supplemented by analyses of manufacturer viability, vulnerabilities, and strategies to eliminate or reduce the operational and technical risks of incorporating commercial technologies into military satellite and heavy launch systems. The Department of the Air Force conducted RAND-recommended experiments to validate the threats and risk-reduction options identified in the study, ensuring that the integration of commercial and military capabilities will both increase national security and support the growth of the U.S. space industry.
A LOOK AHEAD TO IMPACT ON THE HORIZON

Excellent research can often take years to achieve significant impact. Here are just a few streams of RAND research that we believe are poised for impact in 2022 and beyond.

COVID-19 Public Assistance Funding

In support of the Federal Emergency Management Agency (FEMA), RAND developed a framework for assessing allowable medical costs related to the COVID-19 pandemic under the Public Assistance Grant Program. RAND’s foundational analysis is now being used to evaluate how billions of dollars of funding should be dispersed. RAND’s support to the agency is ongoing, and FEMA expected to receive $100 billion in grant requests by the end of 2021.

Better Health Outcomes for Infants

RAND researchers developed innovative tools to find out why infant mortality rates in Allegheny County, Pennsylvania, were so high and why Black babies were three times more likely to die in their first year of life than White babies. For years, public health experts had been struggling to address a troubling trend: Among some groups in southwestern Pennsylvania, infant mortality was much higher than the national average and even on par with rates in some developing countries. In partnership with researchers at Stanford University, Philadelphia’s Children’s Hospital, and Pittsburgh’s Magee-Womens Research Institute, RAND collected data on hundreds of thousands of births, along with U.S. Census and U.S. Environmental Protection Agency data, crime reports, housing statistics, and more, to assess factors that contribute to infant mortality risk. Using powerful machine-learning and econometric tools, the team uncovered a pattern: The most effective interventions were those that addressed maternal health.

RAND researchers are collaborating with Pittsburgh-area hospitals to create user-friendly dashboards based on this research to give health care providers a clearer picture of patient risks and mobile apps to connect patients with services that will give their babies the best possible start in life.
Regional Flood Risk amid Global Climate Change

RAND and a consortium of universities have modeled historical and projected precipitation rates in the U.S. Chesapeake Bay Watershed from 1950 to 2100, developed data-informed standards for stormwater infrastructure design in the region, and designed an interactive tool to guide infrastructure investments. Spanning more than 64,000 square miles and parts of six states, the Chesapeake Bay Watershed is home to 18 million people and diverse ecosystems. The region’s aging infrastructure to manage stormwater runoff will not be able to cope with the effects of climate change, increasing the risk of damage from frequent flooding. Projects to modernize stormwater infrastructure are extremely costly, so it is important for policymakers to make sure that designs consider the full range of possible futures.

The Chesapeake Bay Program now recommends the RAND tool to those applying for funding for stormwater management projects, and Virginia’s Hampton Roads Planning District Commission is using the tool to account for climate change in its infrastructure planning. In November, Maryland’s Department of the Environment released its Stormwater Management Climate Change Action Plan, which adopted the tool and is poised to recommend the expansion of green infrastructure to preserve the health of the watershed and to protect the communities that are most at risk from severe flood damage.

Investments in Women’s Health Care

Women’s health care needs have long been underresourced and understudied relative to those of men, but to make informed decisions about investments in women’s health care, funders, policymakers, and business leaders need information on the potential returns and trade-offs. RAND recently partnered with the nonprofit collaborative Women’s Health Access Matters to address this gap and illustrate how even small increases in funding could lead to measurable improvements in care quality and outcomes for women with Alzheimer’s disease, coronary artery disease, rheumatoid arthritis, and lung cancer.
For each of these conditions, less than 15 percent of outside research funded by the National Institutes of Health focuses on women. Using innovative microsimulation models, the RAND team was able to show the societal benefits of increasing this share, including lower health care costs, better quality of life, and higher labor productivity. The models also showed potential aggregate cost savings of up to tens of billions of dollars, depending on the condition, providing funders and policymakers with a clearer picture of the return on investment in women’s health.

**Cost-Effectiveness of U.S. Special Operations Missions**

When U.S. Special Operations Command wanted to purchase a fleet of “armed overwatch” strike and reconnaissance aircraft for counter-terrorism missions, Congress asked for an independent analysis comparing the costs of using existing aircraft for this purpose with those of a model in development. RAND researchers confirmed that the prototypes being tested by U.S. Special Operations Command would be more cost-effective than aircraft types already in DoD’s inventory. The team briefed professional staff from the House and Senate Armed Services, Appropriations, and Intelligence Committees, and Congress subsequently authorized the command to proceed with the next phase of the $1 billion program. Policymakers continue to monitor the work, and RAND is providing ongoing analytic input on the budget and other aspects of the program.
Last year, Abu Dhabi announced its Early Childhood Development (ECD) Strategy 2035, which prioritizes evidence-based decisionmaking and research-informed policies and practices. Two RAND projects for the Abu Dhabi Early Childhood Authority are helping Abu Dhabi’s government develop a vibrant ECD research ecosystem and a rigorous approach to ensuring the delivery of high-quality services and other sources of support for families with young children. RAND researchers are collaborating with the Abu Dhabi Early Childhood Authority research team and stakeholders from universities, government research groups, and private-sector service providers and funders to develop a vision, goals, and objectives, along with a set of strategic interventions to address gaps in the current research environment. A second RAND team is supporting an assessment of the quality of ECD services for young children and their families in several high-priority areas and identifying evidence-based strategies for a robust quality assurance system that will serve as a model for advancing service quality in other areas. Collectively, the two projects are supporting evidence-based decisionmaking across multiple early childhood policy domains to ensure that Abu Dhabi’s children receive the high-quality services that will help them grow and thrive.

Ten years ago, in my first Year in Review as president and CEO, I wrote that “the research and analysis we do at RAND is to help decisionmakers and the public improve policies, programs, and processes so that nations, communities, organizations, and individuals are better off—healthier, safer, more secure, more prosperous.” The world’s most consequential problems look different now, but, as I reflect on the body of research in my last Year in Review and all that we have accomplished, it is clear that no other institution is as well equipped to make a difference on the issues that matter most.

MICHAEL D. RICH
PRESIDENT AND CEO