INSIDE

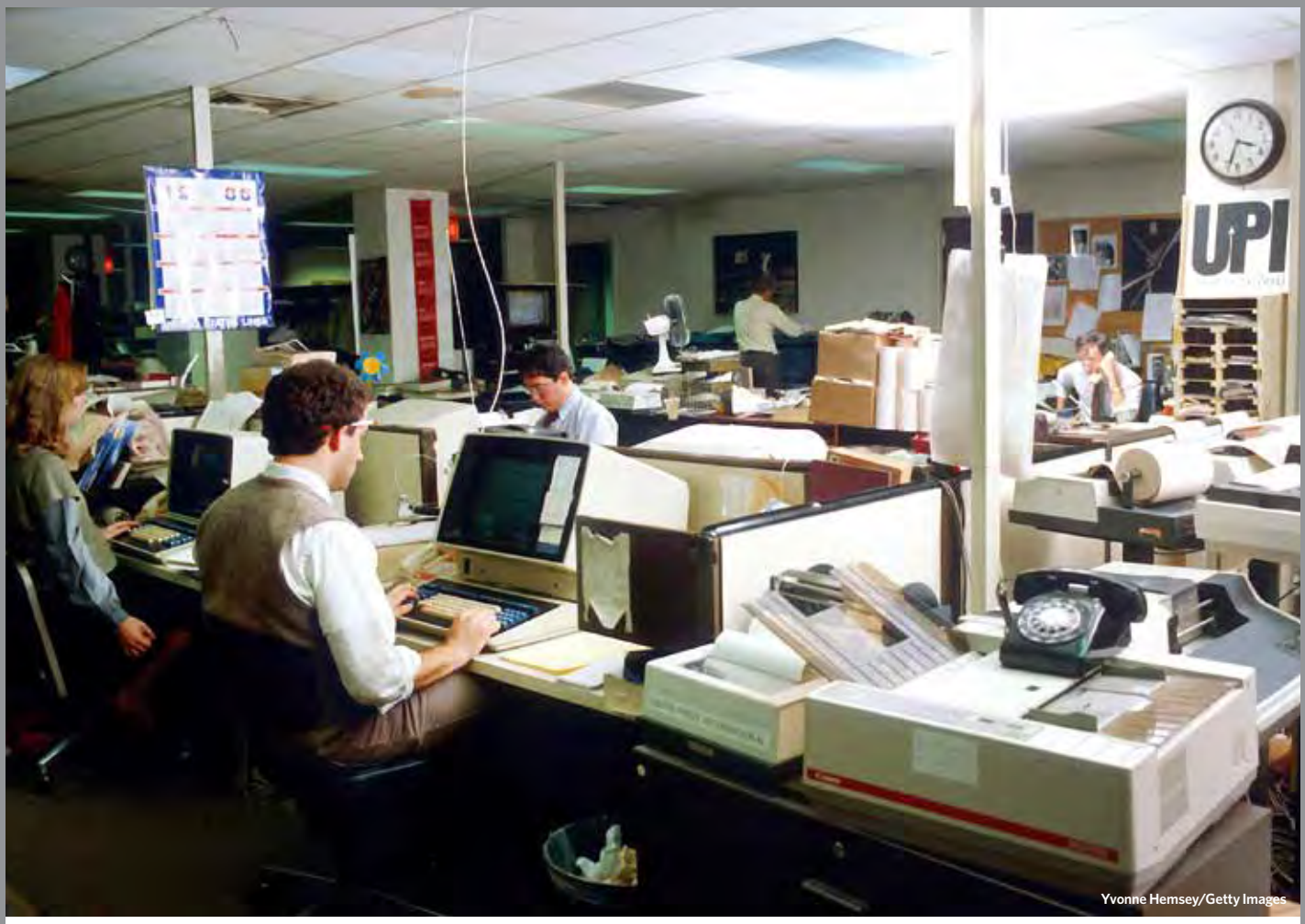
The Pew Charitable Trusts

Trust

Breaking the Plastic Wave

A new global report shows the seriousness of ocean plastic pollution—and offers tangible pathways for change.

Fall 2020 | Vol. 22, No. 4



Yvonne Hemsey/Getty Images

TIME CAPSULE

The founders of The Pew Charitable Trusts believed that an informed and involved public is essential to a healthy democracy. In the 1990s, the organization launched efforts to inspire innovations in journalism. The Pew Center for Civic Journalism, which sought to expand reporting that encouraged citizens to be involved with their communities, was created in 1994 in partnership with a number of organizations, including the Radio and Television News Directors Foundation, PBS' Democracy Project, the Kettering Foundation, and the National Association of Black Journalists. In 1995, Pew began funding the Center for the People and the Press after Times Mirror Company ended its support for the respected polling organization. And in 1997, Pew founded the Project for Excellence in Journalism to research the performance of the press and the impact of what was then the beginnings of the digital revolution in media. The Center for the People and the Press and the Project for Excellence in Journalism would eventually help form what today is the Pew Research Center, which has developed an international reputation for its polling and analysis of key trends in the U.S. and around the world.

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The Pew Charitable Trusts is a public charity driven by the power of knowledge to solve today's most challenging problems. Working with partners and donors, Pew conducts fact-based research and rigorous analysis to improve public policy, inform the public, and invigorate civic life.

Pew is the sole beneficiary of seven individual charitable funds established between 1948 and 1979 by two sons and two daughters of Sun Oil Co. founder Joseph N. Pew and his wife, Mary Anderson Pew.

Gathering the Evidence, Making the Case

Policymaking can be a slow process. Often the underlying problem is complex, solutions are unclear, and there are ideological and substantive disagreements to be aired and addressed. At every step in this process, facts can provide the foundation for conversation and compromise. So the first step in effective policymaking is gathering the evidence: the data, the case studies, and the range of research that can inform smart decisions.

As the pandemic is teaching us, this isn't always a linear process. Initial observations are tested and dismissed. Early evidence that looks promising can later turn out to be incomplete. But the dogged pursuit of facts—often time-consuming—is essential in order to eventually make a case for policies that can solve problems and make our lives better.

In this issue of *Trust*, we're sharing stories about Pew taking on difficult challenges over time by gathering and analyzing relevant facts—often in collaboration with outside experts and stakeholders—that can lead to policy prescriptions with real meaning and long-lasting impact.

Our cover story is about plastics. From water bottles to computer keyboards and grocery bags to polyester clothing, plastics are ubiquitous in our economy and daily lives. And now they are ubiquitous in the world's ocean. Pew and our partners spent more than two years studying the data and, in a report released in July, revealed the extent of the problem: 11 million metric tons of plastic enter the ocean every year, a number that could grow to 29 million metric tons in two decades if nothing changes.

But the data also offers good news: Existing technology and practices are already available to help industry and governments make a difference. Using first-of-its-kind modeling, the report concluded that with challenging but possible systemic change, we can reduce the flow of plastic into the ocean about 80% by 2040.

Collecting data as a first step toward evidence-based policies can take months or even years. But some challenges can't wait that long.

Another long-term challenge is the backlog of required repairs in America's national parks—a list, as we note in our story, with a price tag that approaches $12 billion. To address this long-neglected issue, we collected economic data showing that outdoor recreation contributes $778 billion to the national

economy and generates 5.2 million American jobs. This evidence base helped conservation organizations, businesses, veterans, anglers, and Indigenous people across the country make a case for the Great American Outdoors Act, which Congress passed and President Donald Trump signed in August. The act provides up to $6.65 billion for priority repairs in our national parks and another $900 million to fully support the Land and Water Conservation Fund, making it the biggest infusion of funding to the parks in a half-century.

Collecting data as a first step toward evidence-based policies can take months or even years. But some challenges can't wait that long. That's certainly the case with the coronavirus. There is still much to learn about this virus, and science will eventually provide the answers. But we knew from the outset that health care workers and first responders need reliable and accessible personal protection equipment. Manu Prakash, a 2013 Pew biomedical scholar, led a team at Stanford University that modified off-the-shelf full-face snorkel masks with medical-grade air filters. These Pneumasks, as the lab calls them, are reusable and cost-effective. You can read about the Pneumask and other stories related to the continuing impact of COVID-19 in this issue.

As these stories show, facts and data are essential because they provide a shared language to discuss and dissect society's challenges. Although there can be disagreement on specific policy answers, solid evidence illustrates problems and points to paths forward, allowing competing interests to come together to work for the good of us all.

Susan K. Urahn, *President and CEO*

Trust

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THE BIG PICTURE

A medical researcher studies a petri dish of *E. coli* bacteria. The world is currently focused on the coronavirus, which is primarily transmitted through respiratory droplets. But foodborne pathogens such as some types of *E. coli* remain a serious threat to public health. In 2019, lethal strains of *E. coli* transmitted through cattle grazing near fields of leafy greens and lettuce in California's Salinas Valley caused three outbreaks of foodborne illnesses that sickened people in dozens of states, according to a report by the Food and Drug Administration. Pew's food safety project works to reduce the risks posed by contaminated produce by advocating for better laws and regulations. Sometimes, however, the best way to solve a thorny problem is to convene a multistakeholder meeting in which all of the interested parties—in this case, farmers, cattle ranchers, and officials from federal, state, and local government agencies—can share concerns and shape solutions. Pew is working to foster such conversations as part of its efforts to help reduce these preventable diseases.

Ted Horowitz/Getty Images

Arthur Edmund Pew III
1933–2020

His strong concern for the outdoors led Arthur E. Pew III to take a deep interest in the environmental work of The Pew Charitable Trusts, which included a trip to the Yukon Territory two decades ago where he hiked the tundra with fellow members of Pew's board of directors and learned more about the region's conservation needs. He came upon a small circle stone—a smooth black rock, with a white line running around its circumference. A unique product of nature and—to Mr. Pew—a sign of something more.

He handed the stone to Rebecca W. Rimel, then Pew's president and CEO, who had been hiking with him. "It will not only bring you good luck but when you need a good wish, you rub it," he told her.

Small, kind gestures such as that one. Strong values and clear thinking. A devotion to the Trusts' work to improve the world and a deep affection for his family. These characteristics all defined Arthur Pew, who died on Oct. 2 in White Bear Lake, Minnesota, where he had lived for many years. He was 87.

"He was a gentleman and a gentle man," recalled Rimel, who said she kept that stone on her desk until retiring from Pew on July 1.

The stone would provide its share of good luck and good wishes during Mr. Pew's tenure on the board of this eponymous organization, which lasted from 1996 to 2008. He continued to serve as a legacy director until 2016 and then as an emeritus director until this year.

His time on the board came as the organization underwent significant evolution, from a private foundation to a public charity. Pew expanded from its hometown in Philadelphia to open offices in Washington, D.C.; London; and elsewhere; and its environmental work extended internationally and included conservation of the ocean.

"That would not have been possible without his encouragement," Rimel said. "He never shied away from change or new ideas."

Susan K. Urahn, Pew's president and CEO, said that "the organization and the board were blessed to benefit from his insights, inquisitiveness, advice, guidance, support, and good humor over many years. His warmth, wit, and wisdom will be greatly missed."

In addition to his time on Pew's board, Mr. Pew had been a member of the board of the Glenmede Trust Co. as well as several civic organizations in Minnesota. He also continued his interest in the environment as a board member of the Corporation of the Bermuda Biological Station for Research, now known as the Bermuda Institute of Ocean Sciences.

Mr. Pew grew up on the Main Line outside of Philadelphia, attended The Hotchkiss School in Connecticut, and studied mechanical engineering at Princeton University. He served as an artillery officer in the Army, beginning in ROTC while in college.

During college summers he worked on survey crews and as a track laborer for several railroads. After Princeton, he became a systems analyst and purchasing director with the Chicago, Burlington and Quincy Railroad and its successor, Burlington Northern Railroad, before retiring in 1990.

His work stoked his passion for railroads. He often traveled by train and was a benefactor and board member of several transportation and railroad museums, including the Downeast Rail Heritage Preservation Trust in Maine. He owned a vintage train car that he dubbed the "Gritty Palace," once bringing it to Philadelphia's 30th Street Station as a venue for a reception with his board colleagues.

Mr. Pew's wife of 60 years, Judy, died in 2015; they had four children. Mr. Pew's brother, R. Anderson Pew, and half brother, Sandy Ford Pew, currently serve on the organization's board of directors.

Board Chairman Robert H. Campbell joined Pew's board during Arthur Pew's tenure and said Mr. Pew's spirit enlivened the organization. "Art Pew was a generous man who cared passionately about this institution's role in making the world a better place," Campbell said. "All of us at Pew extend our sympathy to his family and promise to live up to the standards he set."

Atlantic menhaden swim off Stony Beach in Woods Hole, Massachusetts. These small fish are a crucial link in the marine food web, serving as feed for larger sea predators, and they also are valued as commercial products in the animal feed, nutrition, cosmetic, and fishing industries. Pew has long advocated for ecosystem-based management, and in August, Atlantic states fishery managers committed to setting scientifically based catch limits to protect the food web. *Justin Benttinen/Getty Images*

A Big Win for a Small Fish

BY DEMETRA APOSPOROS

Never heard of Atlantic menhaden? If so, you're not alone: The small fish doesn't grab headlines the way that more charismatic marine life such as striped bass, humpback whales, or dolphins do. But menhaden are critical to the survival of all of these predators and then some, including birds such as osprey and eagles. Throughout their traditional East Coast habitat from Nova Scotia to Florida, menhaden are an integral piece of the food web—sustaining so many species that they're often referred to as "the most important fish in the sea."

Menhaden are also caught for use in the manufacture of feed for fish farms, pets, and livestock; to provide oil for the creation of nutritional supplements and cosmetics; and for use as bait by fishermen. That all contributes to making them the largest East Coast fishery by weight, with a catch that registers over 400 million pounds a year. In fact, menhaden have had a major impact on the economy and ecology of our Atlantic coast for centuries.

So when menhaden numbers shrink, animals that depend on them for survival suffer. Yet until 2013, there was no coastwide catch limit on menhaden. Although recent management measures to conserve the species have helped the population to increase, today it remains much smaller than its historic size, and the fish is no longer abundant throughout its full geographic range.

The good news is that recognition of menhaden's importance and of how to best protect them has been growing. Scientists have long recommended that fishery management—even for a single species—should rely on ecosystem-based science, an approach that takes the broader marine food web into consideration when setting catch limits. The Pew Charitable Trusts has advocated for nearly a decade to secure ecosystem-based management for menhaden from the Atlantic States Marine Fisheries Commission (ASMFC), the body that regulates menhaden fishing.

To implement ecosystem-based fishery management for forage fish such as menhaden, research shows that guideposts known as ecological reference points (ERPs) should be used when setting catch limits. ERPs use a computer model to factor in the specific sustenance needs of predators and protect the larger food web. Pew was among more than 80 national, regional, state, and local groups and businesses urging the ASMFC to modernize management of menhaden through the addition of ERPs. And in August, after years of consideration, including a review of hundreds of thousands of public comments, the ASMFC committed to using ERPs to guide how it sets catch limits—a giant win for ecosystem-based science and menhaden, and one that sets a new precedent for using modern advancements in global fisheries science and modeling.

The model chosen by the ASFMC was developed by Tom Miller, a professor of fisheries science at the University of Maryland and director of the university's Chesapeake Biological Laboratory, and Andre Buchheister, who teaches fish conservation and management at Humboldt State University in California. Their research was supported by the Lenfest Ocean Program, established in 2004 by the Lenfest Foundation and managed by Pew.

"The researchers we funded worked with fishery managers for years to develop the model to ensure it generated specific, practical advice on sustainably managing menhaden and their predators," says Lenfest director Charlotte Hudson. "It is gratifying to see its real-world application."

"When enough menhaden are left in the ocean, their predators are healthier and more abundant," says Joseph Gordon, who directs Pew's conserving marine life in the United States project. "Communities along the entire coast benefit as the value of recreational fishing, seafood, and tourism businesses that depend on these species increases. Now, by setting catch limits that account for menhaden's full ecological role, the Atlantic States Marine Fisheries Commission has significantly advanced our country's commitment to the modern, science-based management of fisheries."

Fewer Mortgages Used to Buy Lower-Priced Homes in Philadelphia

Philadelphia has long enjoyed a higher rate of homeownership among low- and moderate-income households than many other cities. But two trends now pose a challenge to would-be homebuyers and people with limited incomes: a drop in the share of lower-priced home sales financed with a mortgage and the rising cost of houses in the city.

An analysis of deed transactions in Philadelphia, conducted by Pew's Philadelphia research and policy initiative and published in June, found that the share of mortgage-backed home sales in the lower-priced half of the market declined from 46% in 2000 to 35% in 2018. At the same time, the median sales price doubled, from $80,000 to $160,000. (These and all of the prices in this piece are expressed in 2018 dollars, to control for inflation.)

The rising median sales prices reflect both a decrease in the number of lower-cost homes sold and an increase in the sales of higher-priced homes. In 2000, nearly 14,000 homes sold for less than $100,000, accounting for 65% of transactions for that year. In 2018, fewer than 8,000 such transactions occurred, representing less than one-third of the year's sales. Over the same period, the number of homes that sold for at least $500,000 more than quintupled, to almost 1,800.

At the same time, the number of transactions for houses priced between $50,000 and $100,000—homes likely to be affordable for many households—declined sharply. In 2000, this price range accounted for roughly 38% of all home sales (over 8,000 transactions), while in 2018 the share in this range decreased by more than half, falling to just 15% of all sales, or roughly 3,800 transactions.

Meanwhile, small-dollar mortgages have been becoming harder to obtain and are less available than larger-dollar home loans. An explanation for this may lie in current lending standards and the fixed costs associated with writing a loan.

"Analysts have found two trends nationally since the Great Recession," says Larry Eichel, senior adviser on the Philadelphia research and policy initiative. "Lending standards have become more restrictive after the housing bubble that set off the recession. And lenders tell us the fixed costs of writing a mortgage—whether for $80,000 or $500,000—are the same, but the profit is higher on the larger sale. That's one reason why smaller mortgages are harder to get."

In Philadelphia, the percentage of lower-priced homes purchased with mortgages declined from 2000 to 2018. For example, 62% of homes sold for prices in the 25th to

30th percentile of the market in 2000 had mortgages; in 2018, when that range represented homes priced from $76,551 to $94,000, it was only 40%.

Homeownership provides financial benefits, including an opportunity to build wealth over time, and mortgages offer people with limited resources the chance to partake of these. "While Philadelphia remains a relatively affordable place to live, that's been changing," says Eichel. "This new data raises questions on whether homeownership will still be attainable for people with lower and moderate incomes."

—Kimberly Burge

New Preserve Protects Critical Habitat in Florida

Off the west coast of Florida north of Tampa Bay, seagrass beds stretch as far as the eye can see—part of the Gulf of Mexico's largest seagrass meadow, home to marine species that are the lifeblood of the region's economy. In late June, Florida designated a new aquatic preserve here, for the first time in 32 years, to protect more than 800 square miles of waters.

Signed into law by Governor Ron DeSantis (R), the Nature Coast Aquatic Preserve borders the shores of Citrus, Hernando, and Pasco counties and is sandwiched between several existing preserves to create a contiguous protected area that covers about a third of the state's Gulf Coast.

The boundaries of the Nature Coast Aquatic Preserve contain 400,000 acres of seagrasses, vegetation that filters pollutants, absorbs heat-trapping carbon, and acts as a buffer against incoming waves to help prevent shoreline erosion. These underwater seagrass meadows shelter shrimps and crabs and provide nursery areas for red drum and other prized fish as well as food for sea turtles and manatees. The habitat supports a range of coastal tourism year-round—from summertime scavenging for scallops to world-class sport fishing and manatee-watching. The designation still allows for these activities, which generate more than $600 million annually for the economy, provide more than 10,000 jobs, and support about 500 businesses.

Pew worked with community members to help achieve the designation, which had broad-based support: More than 100 coastal business leaders and nine state and national recreational fishing and marine industry organizations signed letters of support. Companion bills from Florida Representative Ralph Massullo (R-Lecanto) and Senator Ben Albritton (R-Wauchula) helped create the preserve, the 42nd in the state.

Listing the area as a preserve ensures that it will receive the state's highest level of water quality protection, which means that government and communities must act if runoff from agriculture and cities or other pollution threatens to diminish water quality.

Increasing pollution from agriculture and as a result of a growing population in many parts of the state has made the need for this protection more urgent as nutrient-laden runoff has caused harmful algae blooms and contributed to red tides on both coasts in recent years, resulting in massive seagrass die-offs and fish kills.

"This new preserve could help to prevent that kind of runoff-related disaster along Florida's Nature Coast," says Holly Binns, who directs The Pew Charitable Trusts' efforts to protect ocean life and coastal habitats in the Gulf of Mexico and U.S. Caribbean. "Protecting this valuable habitat will also help support the marine life the region's economy is so dependent on."

—Anne Usher

Mangroves off the coast of Florida's Crystal River provide sanctuary and nurseries for manatees, turtles, fish, and other animals. Such shrub communities, as well as seagrass beds, are integral in the newly formed Nature Coast Aquatic Preserve, in the Gulf of Mexico. Florida's network of preserves helps safeguard water quality and coastal habitats that are vital to the region's economy and wildlife.
Charlie Shoemaker for The Pew Charitable Trusts

Majority of Public Favors the Ability to Sue Police for Misconduct

With legislation to address racism and the use of excessive force by law enforcement stalled in Congress, there is broad public support in the United States for permitting citizens to sue police officers in order to hold them accountable for misconduct or the use of excessive force, according to a survey from the Pew Research Center released in July.

The legal doctrine of "qualified immunity" generally protects officers from being held personally liable in lawsuits unless they commit clear violations of law. A proposal to limit qualified immunity has emerged as a stumbling block in the congressional debate over policing.

Two-thirds of Americans (66%) say that civilians need to have the power to sue police officers to hold them accountable for misconduct and excessive use of force, even if that makes the officers' jobs more difficult. Just 32% say that, in order for police officers to do their jobs effectively, they need to be shielded from such lawsuits.

About 8 in 10 Black adults (86%) favor permitting citizens to sue police officers to hold them accountable for misconduct, as do 75% of Hispanic adults and 60% of White adults. There also are sizable partisan differences in views of qualified immunity, reflecting the divisions over the issue in Congress. A majority of Democrats and Democratic-leaning independents (84%) say citizens need the power to sue police officers for the use of excessive force and misconduct, compared with 45% of Republicans and Republican leaners.

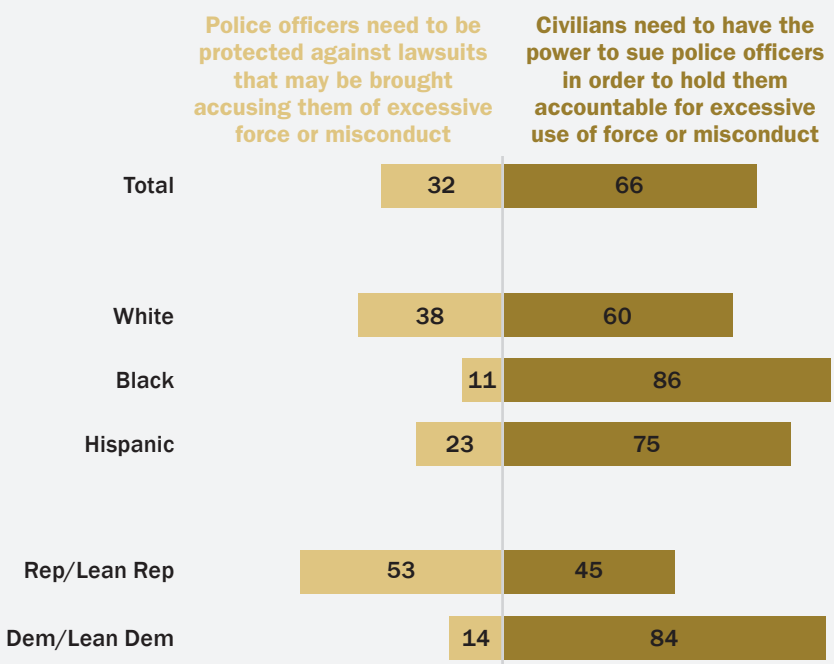
The survey found that the public's evaluations of police performance in several key areas have declined since the Center last explored attitudes among police officers and the public in 2016.

A 58% majority of Americans say police around the country do an excellent or good job of protecting people from crime, which is little changed from the share who said this four years ago (62%). However, there have been double-digit declines in the shares who say police forces do an excellent or good job of using the right amount of force for each situation (from 45% in 2016 to 35% today), treating racial and ethnic groups equally (47% to 34%), and holding officers accountable when misconduct occurs (44% to 31%).

—Demetra Aposporos

Two-thirds of Americans say civilians need to have the power to sue police officers for using excessive force

% who say ...



Notes: "No answer" responses not shown. White and Black adults include those who report being only one race and are not Hispanic; Hispanics are of any race.

PEW RESEARCH CENTER

Pew Scholar Awarded Nobel Prize

On Oct. 5, the Nobel Prize in Physiology or Medicine was awarded to Harvey J. Alter, Michael Houghton, and Charles M. Rice for their discovery of the hepatitis C virus, which affects about 71 million people in the world.

Announcing the award in Stockholm, the Nobel committee called the discovery "a landmark achievement in the ongoing battle against viral diseases."

"Thanks to their discovery," the committee said, "highly sensitive blood tests for the virus are now available and these have essentially eliminated post-transfusion hepatitis in many parts of the world, greatly improving global health. Their discovery also allowed the rapid development of antiviral drugs directed at hepatitis C. For the first time in history, the disease can now be cured, raising hopes of eradicating hepatitis C virus from the world population."

Charles M. Rice, professor of virology at The Rockefeller University and a 1986 Pew biomedical scholar, in his laboratory office in early October, shortly after receiving the phone call informing him that he'd won a Nobel Prize. Rice was awarded the 2020 prize in physiology or medicine, along with fellow American Harvey J. Alter and British-born scientist Michael Houghton, for their discovery of the hepatitis C virus. *John Minchillo/AP Images*

Rice, who is a professor of virology at The Rockefeller University, was recognized for his work while on the faculty of the medical school at Washington University in St. Louis in the 1980s and 1990s. He was named a Pew scholar in the biomedical sciences in 1986, in the second year of the program's existence.

Each year, the program, the first to carry the Pew name, recognizes promising young researchers and provides them with grants, creating a community of more than 1,000 scientists. The grantees meet annually and share ideas. Rice is the fourth Nobel Prize recipient in the group, joining Roderick MacKinnon for chemistry in 2003, Craig Mello for physiology or medicine in 2006, and Carol Greider for physiology or medicine in 2009.

Rice, who was born in Sacramento in 1952 and received his Ph.D. from the California Institute of Technology in 1981, said that collaboration among the many researchers working in the study of hepatitis has been essential.

"We're all a few in a cast of thousands," he told *The New York Times* on the day of the announcement. "I feel a bit odd—a combination of humbled and embarrassed. I think there are many people who should feel very good about what they contributed today."

A self-described night owl, Rice also told a reporter that the early morning call notifying him of his award threw him at first. "My initial impression was this had to be a crank call."

In its announcement, the Nobel committee described each scientist's contribution to the understanding of hepatitis C.

The committee noted that Alter, a researcher at the National Institutes of Health, helped define a new form of chronic viral hepatitis in the 1970s that was separate from the early identification of hepatitis A and hepatitis B infections. Houghton, working for the pharmaceutical firm Chiron in the 1980s, helped isolate the genetic sequence of the virus, which eventually led to its naming as hepatitis C.

"The discovery of hepatitis C virus was decisive, but one essential piece of the puzzle was missing: Could the virus alone cause hepatitis?" the Nobel committee said in describing Rice's role in the discovery. "To answer this question the scientists had to investigate if the cloned virus was able to replicate and cause disease."

Rice's genetic experiments helped answer that question. He showed that the virus could be isolated and cause disease in chimpanzees, resembling that seen in humans. "This was the final proof," the Nobel committee said, "that hepatitis C virus alone could cause the unexplained cases of transfusion-mediated hepatitis."

—Daniel LeDuc

BREAKING THE PLASTIC WAVE

A NEW GLOBAL REPORT SHOWS THE SEVERITY OF OCEAN PLASTIC POLLUTION—AND OFFERS TANGIBLE PATHWAYS FOR CHANGE.

BY JOHN BRILEY

Volunteers attempt to clear discarded plastic bottles and other garbage from a dam on the Vacha River in Bulgaria.
Dimitar Dilkoff/AFP via Getty Images

Bales of crushed plastic waste sit on a truck trailer at a recycling plant in Mexico. Because plastic can be rigid, flexible, or made with several materials, facilities cannot use a single method to process all of it. *Alejandro Cegarra/Bloomberg/Getty Images*

For more than a decade, scientists have warned that humankind is leaving so much plastic in the natural environment that future archaeologists will be able to mark this era by the synthetic waste that was left behind—in short, the Plastic Age. This is especially true in the ocean, where about 11 million metric tons of plastic are dumped each year—an amount that is projected to nearly triple by 2040 without urgent, large-scale action, according to research by The Pew Charitable Trusts and SYSTEMIQ, a London-based sustainability consultancy. The two organizations detailed their findings in a 152-page report, released in July and titled "Breaking the Plastic Wave," and a peer-reviewed study in the journal *Science* that was published online July 23 and in print Sept. 18 (and that also included data on plastic pollution on land).

Plastic in the ocean comes in myriad familiar forms, from shopping bags and takeout food containers to water bottles, toothbrushes, toys, bubble wrap, household appliances, and much more, the report noted. Plastic has been found along virtually every coastline on the planet and throughout the seas, including its deepest and most remote regions. According to the report, if current production, distribution, consumption, and disposal continue at their current pace, 29 million metric tons of plastic would enter the ocean annually by 2040, the equivalent of dumping 110 pounds (50 kilograms) of plastic on every meter of coastline around the world.

But there's still time to reverse this trend and, encouragingly, the technology and methodologies to do so already exist. Using first-of-its-kind modeling, Pew and SYSTEMIQ looked at six scenarios to reduce plastics, ranging from worst case—what the report labels "business as usual"—to a best-case "system change" that would demand a significant revamping of plastics design, production, sale, use, disposal, and recycling. The research found that the system change scenario would reduce the annual flow of plastic waste into the ocean by about 80% by 2040, with action by government and industry leaders driving much of the change.

"The scale of this challenge is daunting," says Winnie Lau, senior manager of Pew's ocean plastics program and lead author on the *Science* study. "Unless we act, by 2040 the amount of plastic going into the ocean would triple annually, and the amount in the ocean would nearly quadruple. That's unimaginable and unsustainable."

Lau adds that governments and businesses already have the tools and resources they need, noting that "we don't have to wait for any new invention or new technology to put a big dent in the problem." But, she says, "the work must start now. Waiting even five years would allow an additional 80 million metric tons of plastic to enter the ocean."

The report reflects more than two years of work by the Pew ocean plastics initiative. Plastic, which is made

95% OF PLASTIC PACKAGING IS USED IN ONE-AND-DONE PRODUCTS

largely from oil, was invented in the 19th century but didn't go into widespread use until the mid-20th century. Production soared from 2 million metric tons in 1950 to 348 million metric tons in 2017—an amount that would double by 2040 under the business-as-usual scenario. Today's global plastics industry is valued at $523 billion.

As plastic has proliferated, so too has the science showing some of the human health impacts throughout the plastic life cycle, from the effects of raw material extraction and production on neighboring communities to the chemicals in food packaging and the deleterious impacts of mismanaged waste. Around the world, plastic waste has blocked rivers and drainage systems, causing flooding and trapping stagnant water that exacerbates the spread of disease. Open burning of plastic waste pollutes air and water, emitting toxic chemicals and greenhouse gases; in 2016, such burning released an estimated 1 gigaton of equivalent carbon dioxide, a figure that's expected to more than double—to 2.1 gigatons—under the business-as-usual scenario, according to the Pew-SYSTEMIQ report.

And in the past 20 years, numerous studies have found plastic compounds in much of the seafood that people eat, adding another potential layer of negative health consequences to the equation.

One major issue in solving the problem is that plastic is virtually indestructible. Pew's Lau points out that "there are practically no natural processes that can degrade plastic back into the ecosystem. Some people say plastic might break down after a few hundred years—but we don't know, because we haven't lived with plastic that long. It will stay with us, maybe forever."

Another huge part of the problem is that 95% of plastic packaging is used in one-and-done products, including items such as condiment packets, food wrapping, and bubble wrap, which means that their life cycle is linear: They're produced, sold, used, and discarded with little chance of being recycled. The ultimate goal, Pew and SYSTEMIQ say, is a circular plastics economy, one in which the need for new plastic production and the waste disposal of existing plastic decline significantly. Those changes would require dramatic drops in production and use of plastics, as well as substantial increases in reuse and recycling.

A shopping bag floats by a whale shark swimming off Oslob in Cebu Strait, Philippines. Plastic pollution has harmed some 800 species that have either ingested it or become entangled. *Steve De Neef/National Geographic Image Collection/Getty Images*

Today, although 71% of the plastic produced is formally collected after use—a figure that doesn't include what's gathered by informal waste pickers around the world—less than 15% is actually recycled. This gap is due, in large part, to two factors: the higher cost of recycled versus raw plastic, and the fact that problematic plastic such as sachets, thin bags, and films cannot be economically recycled. To make a dent in the problem, companies need to make far less plastic than they do today, and recycling needs to ramp up significantly, although neither of those solutions on its own, the report says, would suffice: Improved recycling could reduce the flow of plastic into the seas by 20%, while reducing the production of plastic would yield a 30% drop, numbers that even when combined aren't enough to stave off severe environmental consequences.

Breaking the plastic wave, Pew and SYSTEMIQ say in the report, requires "immediate, ambitious, and concerted actions."The report calls for eight interventions:

- Reduce plastic production.
- Substitute paper and compostable materials.
- Design products and packaging for recycling.
- Expand waste collection rates in middle- and low-income countries.
- Increase mechanical recycling.
- Develop plastic-to-plastic chemical recycling.
- Build facilities that don't allow plastic to leak out.
- Reduce plastic waste exports.

During an online launch event for the report, Martin Stuchtey, founder and managing director of SYSTEMIQ, said that the current global predicament shows "how we have departed from the fundamental design principles of nature." Prior to the deep research that underpins the report, Stuchtey says, many of the propositions for addressing ocean plastic pollution were very often "unreconciled, untested, and not substantiated." But, he noted, the report showed a credible pathway to stemming the flood of plastic pollution in the ocean.

In addition to the environmental argument, financial incentives exist for making systemic change, the report says. Governments would spend an estimated $670 billion over the next two decades managing plastic waste and recycling under the business-as-usual scenario, a figure that could drop to $600 billion if all of the solutions recommended in the report are implemented. Likewise, industry's costs would drop from $10 trillion to $8.7 trillion over that span, and about 1 million new jobs would be created, including in recycling and in the development and manufacturing of alternative materials. In addition, greenhouse gas emissions tied to plastic production, recycling, and open burning would be 25% less under the system change scenario than under the business-as-usual scenario.

The report weighed various factors—affordability, costs, performance, technology, convenience, and feasibility—in evaluating available solutions among the eight interventions. The greatest economic return came from reducing plastic production and use, followed by recycling. Disposal, Stuchtey notes, will always cost governments money, although that cost would be lower if there were less waste to manage. And substituting compostable and paper material for plastic will cost industry money in the near term but reduce the long-term business risks associated with the high cost of waste management. Some governments have made manufacturers responsible for the costs of plastic processing and disposal.

Although, as the report points out, the technology already exists to implement the needed interventions, the report adds that to be successful, governments and industry need new regulatory frameworks, business models, and funding mechanisms. With those in place, projected plastic waste generation could be reduced by nearly one-third through elimination, reuse, and new delivery models, such as refillable containers and product subscription services that collect and reuse

Debris swoops in near the shoreline of Naples, Italy, after a storm. Drinking containers and other plastic items litter beaches, block drains and wastewater systems, and provide a breeding ground for disease. *Salvatore Laporta/KONTROLAB/LightRocket via Getty Images*

containers, and by another 17% by substituting plastic with paper and compostable materials. Designing products and packaging for recycling—instead of for single use—would expand the share of economically recyclable plastic from an estimated 21% to 54%.

The report also calls for a "substantial shift of investment away from the production of new plastic to the development of reuse and refill systems and sustainable substitute materials," something the world's major lenders may be hesitant to do unless they see a high likelihood that it will pay off.

And the document offers some detailed guidance for countries in different economic strata.

"Breaking the plastic wave will require every nation to do its part, but in different ways," the report says. "Middle- and low-income countries should focus on expanding collection of plastic waste, maximizing reduction and substitution, investing in sorting and recycling infrastructure, and reducing leakage from waste sites. High-income countries should incentivize reductions in plastic usage, boost recycling rates, end exports of plastic waste, and address microplastic leakage."

Although communities around the world have already begun banning plastic shopping bags, and restaurants are forgoing plastic straws, these efforts aren't enough, the report says. Even if all governments and companies follow through on their current commitments to reduce plastic use and waste, the annual volume of plastic flowing into the ocean would drop only about 7% by 2040.

One reason is that most new regulations—such as the European Union's 2019 directive to reduce single-use plastics—focus on specific products, such as bags or straws, rather than on systemic change, and do not significantly curb the projected growth in plastic production. Industry has also made high-profile commitments to fight plastic pollution—Nestle, for example, has vowed to make 100% of its packaging recyclable or reusable by 2025—but even if fully implemented, these steps will address only a tiny fraction of the problem.

Systemic change, in contrast to relying on product-specific regulations, would require middle- and low-income countries to expand their waste collection rates to 90% in urban areas and 50% in rural areas and to support the informal collection sector. Achieving that goal would require adding 4 billion people to the world's waste and recycling collection ranks, or 500,000 people per day, every day from now to 2040. And globally, mechanical recycling capacity would need to double to 86 million metric tons per year. Pew's Lau says both of these targets are ambitious but reachable with existing technology.

Beyond the use of existing technology, industry is also seeking to develop new technology to perform a type of recycling called chemical plastic-to-plastic conversion—which makes new products from plastic that, due to its composition, cannot be economically recycled by other means. Under full system change, this technology, using clean energy, could reach a global capacity of up to 13 million metric tons per year—only 6% of global plastic waste—by 2040. And to slow ocean plastic pollution until that capacity is reached, industry would need to build facilities to dispose of the 23% of plastic that cannot be recycled economically with existing technology. Also, governments would need to reduce by 90% plastic waste exports to countries with low collection and high leakage rates—a significant demand on a system under which more than 15 million metric tons of plastic waste were exported globally in 2016, the latest year for which reliable data are available.

Lastly, the report calls for tackling a particularly vexing component of ocean pollution: microplastics, or particles less than 5 millimeters in size. Microplastics now account for 11% of the 11 million metric tons of plastic entering the ocean annually, and the report says that applying new technology to the design and production of four major sources of microplastic—tires, textiles, personal care products, and production pellets, which are the small beads that companies melt and mold into their products—would reduce microplastic leakage to the ocean by 1.8 million metric tons per year (from 3 million metric tons to 1.2 million metric tons) by 2040.

Above: People carry loads of plastic items through a municipal dump in Maputo, Mozambique. Around the world, many households do not have formal waste management services to dispose of or recycle plastic waste safely, and rely instead on informal waste pickers.

Opposite: A warehouse full of household materials awaits recycling at a Melbourne, Australia, company that has gone bankrupt. The state government and the warehouse owners do not know what to do with the largely unsorted material, which cannot be easily sold to facilities able to process it. As a result, Melbourne municipalities are sending thousands of tons of recyclable waste to landfills.

Pew and SYSTEMIQ see the report as a blueprint for substantially reducing ocean plastic pollution. "This was an essential first step to quantify the problem and identify solutions," says Richard Bailey, the University of Oxford professor of environmental systems who designed the scenario models and the software that simulated the flow of seven types of plastics over one 25-year period with numerous variables—a process that eventually yielded 5.2 million years' worth of simulations. "An important next step is to see how these solutions can be implemented on a small scale, in individual cities and countries."

Alan Jope, CEO of Unilever, who also spoke at the virtual launch event in July, said the report could prove to be the defining strategic baseline for tackling ocean plastic pollution. He decried "our throwaway business models and throwaway culture," and said Unilever, a manufacturer of many consumer products, has committed to halve its use of virgin (raw, nonrecycled) plastic by 2025, and to collect and recycle more plastic from the environment than the plastic packaging that the company sells.

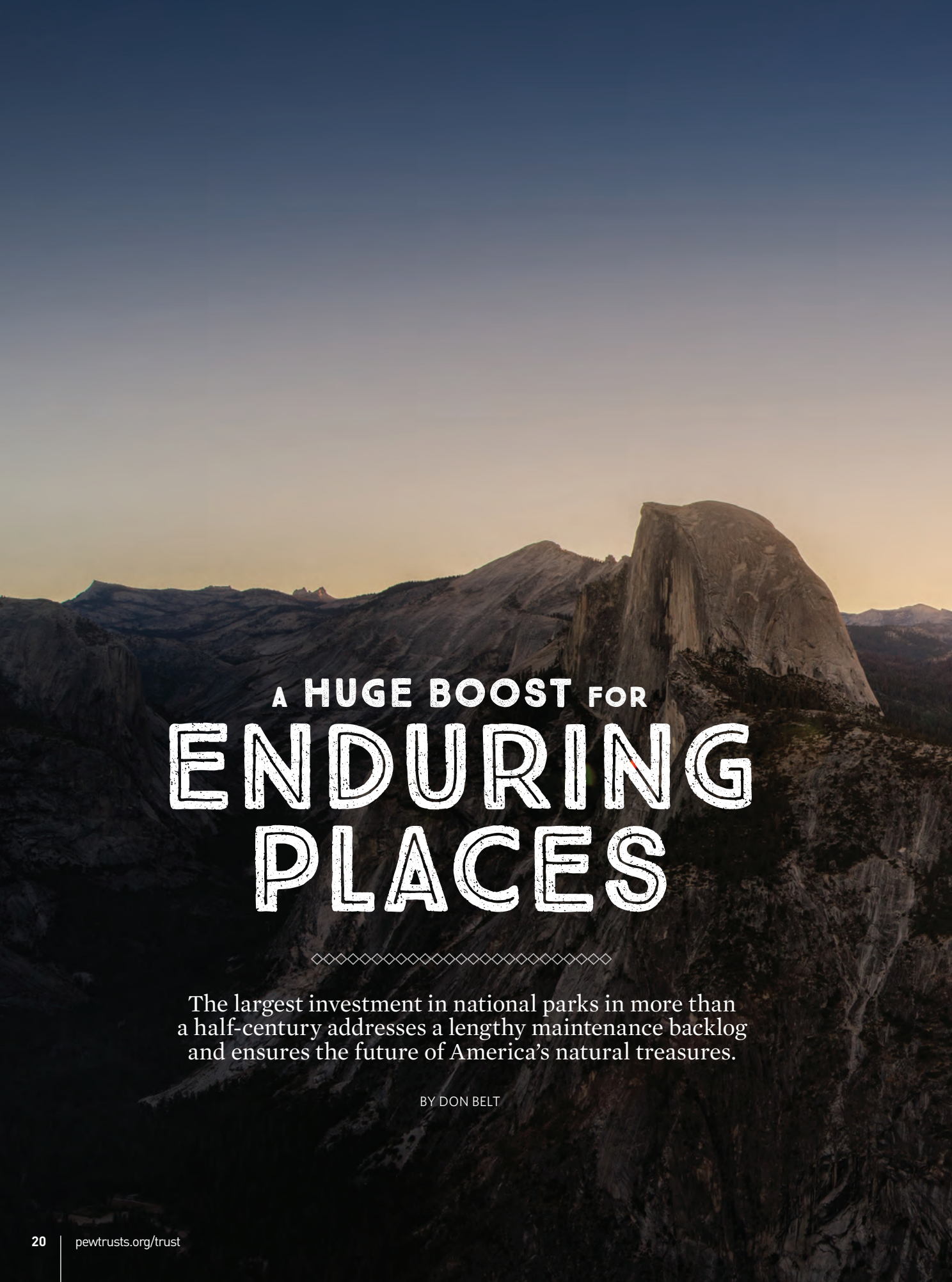
As for Pew, the next steps involve seeking government, businesses, and civil society signatories to a joint statement on preventing ocean plastic pollution; working to make the report findings more accessible to policymakers; and determining how the Trusts can best position itself to help solve this problem.

As difficult as the problem is, the reward for success is enormous: "It will mean less plastic going into the ocean, less being burned, better air quality, less greenhouse gas emissions, and improved human well-being and health," Lau says. "Also, governments save billions of dollars, and businesses and investors have new opportunities for innovation. And isn't that the kind of future we all want, for ourselves, our children, and our ocean?"

John Briley is a staff writer for Trust.

“ALTHOUGH 71% OF THE PLASTIC PRODUCED IS FORMALLY COLLECTED AFTER USE...LESS THAN 15% IS ACTUALLY RECYCLED”

Jason South/The Age via Getty Images



A HUGE BOOST FOR ENDURING PLACES

The largest investment in national parks in more than a half-century addresses a lengthy maintenance backlog and ensures the future of America's natural treasures.

BY DON BELT

From a bird's-eye view of Yosemite National Park, a visitor may not spot any damage. But the park has a repair bill of $555 million—and until now has lacked the resources to do the work. That changed with the passage of the Great American Outdoors Act, which provides money for repairs at national parks. At Yosemite, transportation infrastructure—including access to trails, campgrounds, and difficult-to-get-to vistas—accounts for about half of the maintenance backlog. *Stanley Chen Xi/Getty Images*

The mountains, canyons, and waterfalls we admire in America's national parks will last forever, or at least until the next geological epoch.

Everything else in the parks requires maintenance.

And that takes money, lots of money, which our national parks haven't had enough of for years. Even as visits to many national parks have soared, the National Park Service (NPS) has received inconsistent annual funding and has absorbed budget cuts that forced the postponement of all but the most urgent maintenance projects, leading to a national backlog estimated at $12 billion.

As park infrastructure ages, it deteriorates, and parks may become less accessible, more hazardous, and less beneficial to the local communities whose economies depend on the billions of dollars that park visitors spend. Run-down facilities also tarnish the reputation of the National Park System, which has been a global model for land and historic conservation.

For nearly five years, helping to restore the national parks has been a priority for The Pew Charitable Trusts, which has worked with organizations and communities across the country. So it was good news in August when a politically polarized Congress came together to pass the Great American Outdoors Act with overwhelming bipartisan support. The landmark legislation was quickly signed into law by President Donald Trump.

The law establishes the National Parks and Public Land Legacy Restoration Fund, which will direct up to $1.9 billion annually for the next five years for priority repairs within national parks, national forests, wildlife refuges, Bureau of Land Management lands, and Bureau

Pavement repairs take place in the shadow of snowcapped views in Denali National Park, where a single road snakes through more than 6 million acres of wilderness in the Alaskan interior. The park needs around $30 million to fix its transportation infrastructure. Over the next five years, national parks will receive $1.3 billion each year to address priority repairs. *John Elk/Getty Images*

of Indian Education schools. The NPS will receive $1.3 billion of that funding each year.

The act also provides full and permanent funding of $900 million a year for the Land and Water Conservation Fund, which has been used for more than 50 years to protect natural and cultural treasures in every state, from national parks and endangered species to historic battlefields and local parks and playgrounds.

Financing for the act, which represents the largest investment in maintenance and preservation of America's parks and public lands since the Eisenhower administration, comes from nontaxpayer dollars in the form of mineral revenues from energy development on federally owned lands and waters.

"For too long, the National Park Service has not had the funding necessary to properly maintain our natural and cultural resources," says Senator Mark R. Warner (D-VA), one of the bill's leading cosponsors. "Now, thanks to this remarkably bipartisan effort, our national parks will receive a needed shot in the arm that will cut the deferred maintenance backlog in half and help preserve these treasures for future generations to enjoy."

His Senate colleague Lamar Alexander (R-TN), one of the bill's most vocal supporters, is a longtime advocate for the national parks with a deep affection for the Great Smoky Mountains in his home state. He calls the new law "the most important and significant conservation and outdoor recreation legislation in at least half a century," adding that "good

FOR NEARLY FIVE YEARS, HELPING TO RESTORE THE NATIONAL PARKS HAS BEEN A PRIORITY FOR THE PEW CHARITABLE TRUSTS.

people have been trying since 1964 to enact permanent funding of the Land and Water Conservation Fund."

Pew's restore America's parks campaign was initiated in 2015 at the suggestion of Lyda Hill, an entrepreneur and philanthropist who has partnered with Pew on a number of environmental, health, and science initiatives. An ardent fan of the national parks, Hill was dismayed by the park system's maintenance backlog, which left many of America's national treasures with washed-out trails, crumbling roads, decades-old water and electrical systems, and deteriorating historic structures.

"I saw an urgent need and wanted to do something about it," Hill recalls. "Partnering with Pew meant I'd be working with an organization that could pinpoint what needed to be done and provide measures of success so that we could deliver the critical investment our national parks deserved."

Pew focused on raising public awareness of the problem, building support across the nation, and educating lawmakers on both sides of the aisle. The restore America's parks

campaign built a ground-up coalition of groups and individuals to focus attention on NPS maintenance needs in communities across the U.S., and thousands of national and local groups mobilized in support of restoring the parks. By 2019, more than 8 in 10 Americans surveyed in a Pew-commissioned poll supported federal legislation to fix the national park repair backlog.

The funding arrives not a moment too soon.

Thousands of projects are in the queue for repairs, including building repairs and repaving of potholed roads at Yellowstone National Park. At the Grand Canyon, millions of dollars are needed to fix the Transcanyon Water Distribution Pipeline, the South Rim's only source of potable water, which has been patched together for a decade. The park headquarters at Acadia National Park has a cracked foundation and a heaving roof. And at Great Smoky Mountains National Park, there are roads to resurface, bridges to rebuild, and water and sewage systems to update.

The asphalt in a road cracked open after the 2018 eruption of the Kilauea volcano in Hawaii's Volcanoes National Park, which was followed by some 60,000 earthquakes. Work on repairing the damage—including collapsed roads, toppled buildings, rock falls, and breaks to water and sewer lines—continues to this day. *Dudarev Mikhail/Shutterstock*

Great Smoky Mountains is the most popular national park in the country, visited last year by more than 12.5 million people drawn to the historic buildings, charismatic wildlife, and scenic vistas: mountains draped in ghostly, low-hanging clouds that drift across thickly forested hillsides like woodsmoke rising from some frontiersman's lonely homestead. When those White pioneers arrived in the late 1700s, they learned that native Cherokee called this country Sha-kon-o-hey, place of the blue smoke—and the name stuck.

This past June, as the nation locked down during the COVID-19 pandemic, more people visited the park than in any June in history, most of them in motor vehicles creeping single file along the park's forested two-lane roads, eyes peeled for a glimpse of *Ursus americanus*, the iconic black bear.

"Most of our infrastructure is 50 years old or older," says Alan Sumeriski, a laconic 52-year-old park ranger who's worked as a steward of federal lands since college. These days he's a decorated NPS veteran who oversees maintenance as the Great Smoky Mountains facilities chief.

"Aside from the roads, the biggest challenge we have is underground," Sumeriski says, citing the hidden network of aging pipes and tanks at 27 water-pumping stations and treatment plants around the park. "It's like when the car manufacturer recommends you change your oil every 5,000 miles. If you miss the interval and never scrape together the money to do the required maintenance, your car may run for a while. But you're living on borrowed time."

Sumeriski's warning was borne out in August, when the water and sewage system failed at Elkmont, one of the park's most popular campgrounds. The roots of a sycamore tree finally strangled and burst the worn-out underground pipes. Replacing it will cost around $2.6 million, Sumeriski figures—a big number, for sure, though a fraction of the park's total $236 million in deferred maintenance.

Other properties in the National Park System face even larger deferred maintenance gaps: Yosemite is staring at a bill high enough to rival El Capitan: $555 million. Glacier's cost ($180 million) is lower, as is Olympic's ($126.5 million), while Yellowstone, the first national park, is in the hole for $640 million. Shenandoah ($90 million), Acadia ($85.8 million), and Everglades ($74.7 million) are better off, while the National Mall and Memorial Parks in Washington, D.C., weigh in at a hefty $655 million.

Though less costly, historic sites such as the Ebenezer Baptist Church in Atlanta, Gettysburg National Military Park, and the Selma Interpretive Center at the foot of the Edmund Pettus Bridge in Alabama are equally important and require constant maintenance and repairs. With budgets shrinking, visits rising, and 419 parks and national historical sites to maintain, the NPS has been performing triage for years.

Sumeriski calls the passage of the Great American Outdoors Act "a great day for the National Park Service," adding that "we haven't seen an infusion like this since Mission 66": the massive federal investment in the parks, about $8 billion in today's dollars, made between 1957 and 1966, after the national parks had been left to languish during and after World War II. Much of the infrastructure at Great Smoky Mountains—housing, vehicle sheds, maintenance buildings, pumping stations, pipes, parking lots, and trails—dates back to Mission 66 or even earlier.

Unlike parks in the Western U.S. that were carved wholesale from federal lands, the acreage for Great Smoky Mountains National Park was purchased in the 1920s by a tenacious coalition of writers, nature lovers, philanthropists, business leaders, state legislators, and grassroots volunteers, including thousands of schoolchildren in Tennessee who went door to door collecting spare pennies and proudly contributed $1,391.72—about $27,000 in today's money—to the cause. When the park opened its gates in 1934, these magnificent lands had not been set aside by the government; they'd been fought for, deed by deed, by an army of true believers.

Mission 66 was the result of public outcry over the state of our national parks, and a similar groundswell moved the Great American Outdoors Act across the finish line, says Pew's Marcia Argust, who directs the parks campaign. It enlisted "elected officials, businesspeople, outfitters, preservationists, veterans, conservationists, engineering and design firms, hotels and restaurants, faith groups, Indigenous people, recreation companies, and sportsmen" for a diverse collection of voices that prompted Republicans and Democrats to join forces and pass the legislation, she says.

Now that the bill has become law, the Department of the Interior is preparing a detailed list of priority projects to submit to key congressional committees.

In the meantime, Sumeriski and his fellow park administrators across the U.S. will be prioritizing their long list of maintenance projects, including the big-ticket expenditures on road repairs and heavy-duty infrastructure. They'll also be consulting on their to-do list with local volunteer groups, which support the park by raising money for smaller, more manageable maintenance projects that private donors are willing to fund.

One of hundreds of such groups around the country, Friends of the Smokies, was founded in 1993 when Gary Wade and Tom Trotter, boyhood friends from Sevierville, Tennessee, came across a "dangerously dilapidated" fire lookout tower on Mount Cammerer while hiking in the park. They approached the park's superintendent, Randy Pope, who wanted to rebuild the tower but had no money for it. The two made him an offer: Trotter, an award-winning architect, would draw up plans for a restoration, while Wade, an appeals court judge who would later serve as chief justice of the Tennessee Supreme Court, would raise the $35,000 to build it.

Wade and a circle of advisers made 151 phone calls—including one to Tennessee's former governor, Lamar Alexander—and began to educate their neighbors about the maintenance backlog at the national park they all

loved. "Most of them were shocked that the park needed help—they thought the federal government took care of everything," Wade says. "I had to explain that the park was built for a 1934 population but was now getting millions of visitors every year."

Wade's friends agreed to chip in what they could, and the Friends of the Smokies was formed. Its first project, the Mount Cammerer fire tower restoration, was built with materials ferried in by a donated helicopter and funds raised during those 151 phone calls.

In the years since, members of the Friends of the Smokies, like similar organizations throughout the U.S., have channeled their passion for the parks into raising money for relatively modest initiatives—trail maintenance, scientific research, historic preservation, habitat restoration, and educational programs—which has allowed their partners in the NPS to spend its limited maintenance dollars on larger "must do" projects. The Friends will continue to support the park, Wade says, by taking on projects that are more appealing to private philanthropists.

"In all of this, we and our partner organizations—ordinary citizens who love the outdoors—are simply following in the footsteps of those early visionaries who assured the preservation and protection of these lands," says Wade.

His voice is typical of those that Pew's Argust heard echoing on Capitol Hill over the past few years as deferred maintenance legislation has moved through Congress. She also notes that more than 200 local governments—cities, towns, and counties—passed resolutions urging Congress to provide resources to fix national park sites.

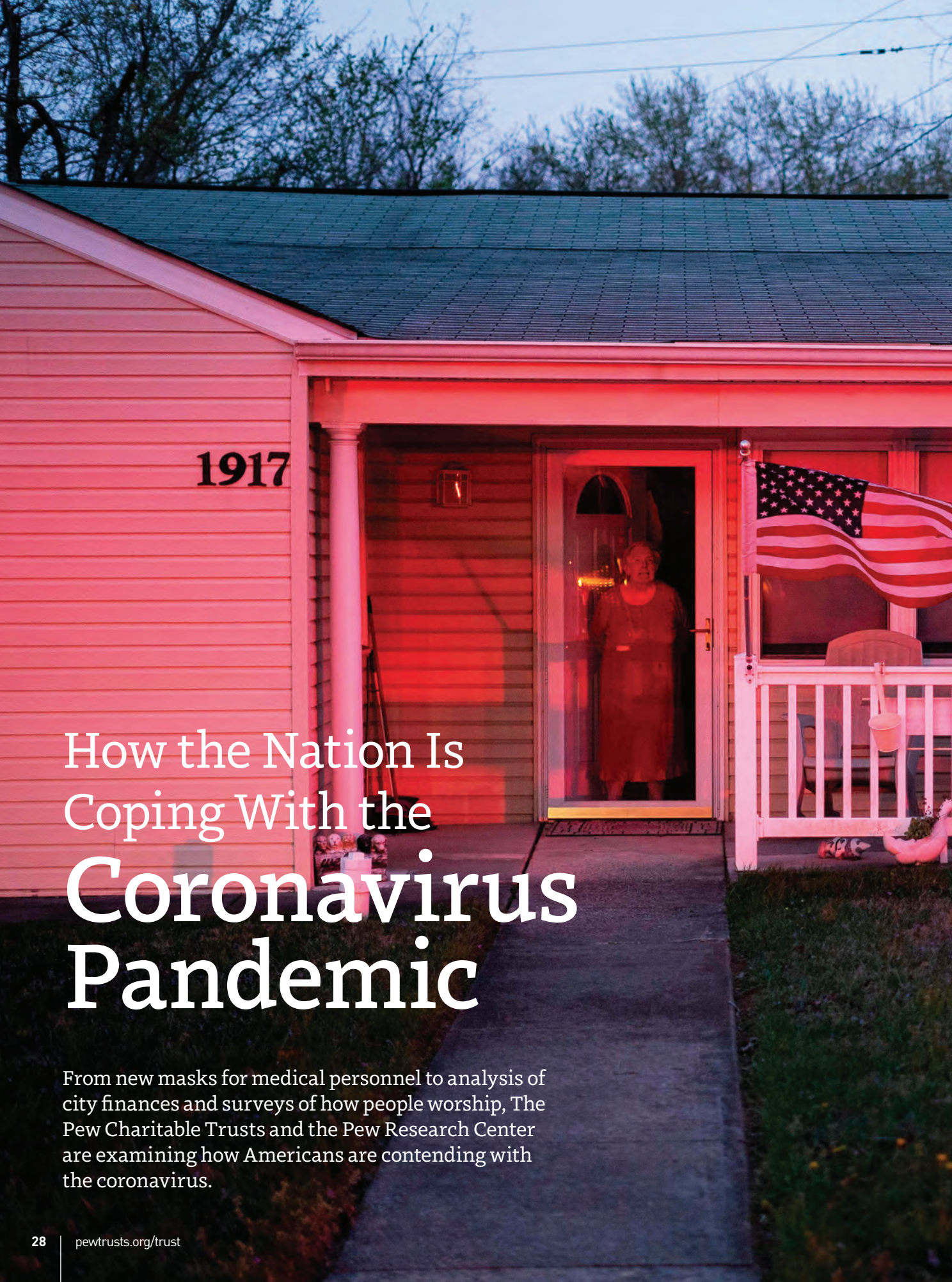
To a small-town mayor or county executive near a national park site, "this act isn't just a conservation measure," Argust says. "It's a jobs bill."

She explains: "People need their national parks restored and maintained for the economic benefits they bring—jobs, visitor spending, tax revenue. During the current pandemic, these jobs are more important than ever. And implementation of the act will create infrastructure jobs. Members of Congress pick up on this local support—it's very hard to ignore."

"It wasn't easy," adds Lyda Hill about the effort that culminated in the Great American Outdoors Act, which was driven, start to finish, by Americans' love for their parks. "But by tackling the maintenance issue together, we've solved a problem of national significance."

Don Belt is a longtime writer and editor for National Geographic *who wrote about the maintenance backlog in the national parks in the Winter 2017 issue of* Trust.

National Park Service trail crew members prepare to rappel down the side of a cliff during trail repair in Grand Canyon National Park. About 4.5 million people come to the Grand Canyon each year, but the visits take their toll: The park needs $313 million to repair wear-and-tear damage to one of the nation's most popular destinations.
John Moore/Getty Images



How the Nation Is Coping With the Coronavirus Pandemic

From new masks for medical personnel to analysis of city finances and surveys of how people worship, The Pew Charitable Trusts and the Pew Research Center are examining how Americans are contending with the coronavirus.

A woman gazes out her front door as firefighters and paramedics, wearing masks to protect themselves against the coronavirus, respond to a 911 call about an elderly man who had fallen in his home in Glen Burnie, Maryland. *Alex Edelman/AFP via Getty Images*

Scott Strazzante/The Chronicle via Polaris Images

Innovative Science to Protect Medical Workers

By Demetra Aposporos

In mid-March, when Manu Prakash developed a fever and cough soon after returning to his California home from a work trip in Europe, he feared the worst. At the time, COVID-19 infections were raging across Europe and had just been discovered in all 50 U.S. states, with President Donald Trump having declared a national emergency. Although Prakash, an associate bioengineering professor at Stanford University, would end up testing negative for COVID-19, he couldn't stop thinking about the disease and how he had watched the doctors and nurses who examined him at Stanford Medical Center discard their personal protective equipment (PPE) after each interaction. With fears already rising that PPE would soon be in short supply, he wondered if there might be a way to tailor some existing item to work as protective equipment.

Manu Prakash

Prakash (right), a 2013 Pew biomedical scholar, runs a lab he describes as "curiosity-driven" and dedicated to inventing creations he likes to call "frugal science"—making him well equipped to noodle on the looming problem of PPE shortages. And one possible solution was soon as clear to him as the nose on his face—or, rather, as clear as the full-face snorkel mask he had just unpacked from his European sojourn. Could it, he mused, somehow be adjusted to work as protective gear for front-line medical workers?

It wasn't long before Prakash and 10 scientists in his lab were modifying the snorkel mask to work as a substitute for an N95 respirator, which offers the highest level of protection against airborne coronavirus. The solution they engineered is both innovative and strikingly simple: a new part, or coupler, that fits onto the mask's existing breathing tube, allowing for the addition of a medical-grade air filter. The team dubbed its creation (above) the "Pneumask."

The Pneumask works with existing rated medical filters in standard use at hospitals and is reusable after a decontamination process the team explains in depth on the website pneumask.org. Thinking ahead about the potential for different kinds of shortages, the team also designed a second coupler piece that fits onto the first one, which allows for industrial-grade filters to be attached—giving hospitals access to two different

Carlos Avila Gonzalez/The San Francisco Chronicle via Getty Images

supply chains for filters. Perhaps best of all, the couplers can be custom-made on a 3D printer, and instructions for making them are available online through a Google document accessible to anyone.

It wasn't long before people far and wide were making and using the Pneumask. (See Q&A, page 42.) Currently some 23,500 Pneumasks are in use in 24 countries, with 3,200 of them deployed across the U.S., according to the team's website. Although it has not yet received FDA approval, an array of doctors who have used the mask attest to its sealing capability, filter performance, and clinical usability and say that it's both effective and practical—a testament to the team's "frugal science."

Prakash believes that a great deal of lasting innovation will result from the challenges presented by the coronavirus. "This pandemic has truly exposed the underbelly of weaknesses in our protection for health care workers," he says. And, he adds, he's happy to have been able to contribute to the effort to protect them.

Demetra Aposporos is senior editor of Trust.

Pandemic Brings Fresh Challenges for City Budgeting

Officials from Philadelphia and other cities discuss how they're responding to economic shock.

By Larry Eichel and Thomas Ginsberg

For city governments, the budget process is never easy. But this year, the COVID-19 pandemic and resulting recession have made that work exceedingly difficult—and the pain is only just beginning.

This was the consensus from several top city budget officials speaking at a July 8 online panel discussion organized by The Pew Charitable Trusts. The spending plans being adopted by major cities throughout the country are based on revenue estimates containing more than the usual dose of uncertainty.

"We expect there will be need for some adjustments," said Philadelphia Budget Director Marisa Waxman, referring to the $4.8 billion budget the city adopted in late June. "This has been a very challenging time. Philadelphia will survive; it has been around for 300 years and isn't going away."

The virtual panel discussion featured Waxman, San Francisco Controller Ben Rosenfield, Houston Deputy Finance Director William Jones, and budget consultant John W. Hill, who served as Detroit's chief financial officer during its 2013 bankruptcy. The hour-long conversation before an online audience of more than 100 city policymakers, public finance experts, and other stakeholders was part of Pew's project on local fiscal oversight.

Houston and Philadelphia have approved spending plans for the fiscal year that started July 1. Although San Francisco's fiscal year also began July 1, its leaders delayed the new budget for three months to give themselves more time to deal with the economic shock.

During the discussion, the officials detailed how they scrambled to make cuts and offset the decline in local revenues, which was greater in cities like Philadelphia that rely more on income and sales taxes than on less-volatile property taxes. (Unlike the federal government, local governments cannot run budget deficits.) For now, none of the jurisdictions plans to reduce city employee pension contributions or borrow new money to close budget gaps. Each received funding from the federal coronavirus aid package, which must be spent on COVID-19-related expenses by December.

Houston, whose mayor initially talked about widespread furloughs of city workers, managed to avoid those and pass a budget roughly equal to the previous year's $2.5 billion spending plan. The city is seeing a big drop in sales tax revenue, and the law limits the amount it can get from property taxes, its main source of revenue, Jones said. This left Houston with a gap of about $170 million, which it filled by cutting costs, by taking about $90 million from its reserves, and by "redeploying" workers and jobs into COVID-19 relief work.

That redeployment enabled Houston to fund those workers and jobs with some of its $404 million in coronavirus aid, Jones said. Houston also projected having enough revenue this year to avoid tapping into its small rainy day fund. Neither Philadelphia nor San Francisco took such steps with that aid ($276 million and $154 million, respectively), and neither city is expected to replenish its rainy day fund this year.

San Francisco is likely to cut its fiscal 2021 budget below last year's $6.5 billion, Rosenfield said. The city's property tax revenues have held steady, but just about everything else has plunged: Hotel tax revenues this spring, for example, fell from $100 million to approximately $10 million. The projected budget gap stands at $750 million. The mayor has ordered all departments to plan for 10% cuts and brace for even more.

Like Waxman, Rosenfield understands that the uncertainty surrounding the coming months means that San Francisco's budget will probably have to be revised early and often. "We have an office pool going on how soon the first readjustment will have to be made. I'm guessing three months," Rosenfield said. In addition, he expressed hope that cities will increasingly use technology to deliver services—such as license renewals—remotely and more efficiently, a point echoed by the others.

Philadelphia's $4.8 billion operating budget is about 8% smaller than the one that Mayor Jim Kenney proposed in early March before the outbreak. Then the recession hit sales tax and income-based taxes hard: The city initially warned of a $649 million shortfall, then increased it to $749 million as the numbers came in. To close the gap, the city took $229 million from its reserves and rainy day fund and made up the rest with targeted tax and fee increases as well as layoffs. But that has left little cushion for another shock.

"We won't be able to dig $100 million from the seat cushions again," Waxman said, agreeing with the others that some of the budget-balancing tactics used this year won't be available next year. Among the cities with current officials on the panel, only Philadelphia has laid off city workers at this point—454 in total, mostly part-time and temporary employees.

Hill said the economic shock, even though it came suddenly, is not a passing blip after which urban life—and the items and activities that cities tax—will return to normal. "There will be some changes in how corporations do business," he said, "how we deal with physical infrastructure, how we deal with distance learning and work—and those are likely to be permanent."

These changes and others, Hill said, are likely to complicate city budgeting for years to come.

Larry Eichel is a senior adviser and Thomas Ginsberg is a senior officer with The Pew Charitable Trusts' Philadelphia research and policy initiative.

David Maialetti/The Philadelphia Inquirer via AP Images

Will the coronavirus permanently convert in-person worshippers to online streamers?

By Alan Cooperman

One-third of U.S. adults recently have watched religious services online or on television, and a little over half of them—or 18% of all adults—say they began doing this for the first time during the coronavirus pandemic. Of course, if you're worshipping remotely, you can't hug the other members of your congregation or shake hands with your minister, priest, rabbi, or imam. But you can wear whatever clothes you want, turn up (or down) the volume, forget about traffic in the parking lot, and easily check out that service you've heard about in a congregation across town or even across the country.

Whatever the reasons, lots of people like virtual worship. Nine out of 10 Americans who have watched services online or on TV in the past month say they are either "very" satisfied (54%) or "somewhat" satisfied (37%) with the experience; just 8% say they are "not too" or "not at all" satisfied, according to a Pew Research Center survey conducted in mid-July.

So what does this bode for the future? By the time the COVID-19 pandemic has finally run its course, will Americans have lost the habit of going in person to a church, synagogue, temple, or mosque? Some commentators have suggested that just as the pandemic has accelerated the trend toward shopping online and made Americans reliant on the internet for work, school, health, and entertainment, so might many, if not all, varieties of religious experience move online in the 21st century.

But that's not what the people who've been worshipping online see in their future. On the contrary, most U.S. adults overall say that when the pandemic is over, they expect to go back to attending religious services in person as often as they did before the coronavirus outbreak.

To be sure, a substantial share of Americans (43%) say they didn't attend religious services in person before the pandemic struck and they don't plan to start going to a church or other house of worship when it's all over. But 42% of U.S. adults say they plan to resume going to religious services about as often as they did before the outbreak, while 10% say they will go more often than they used to, and just 5% anticipate going less often.

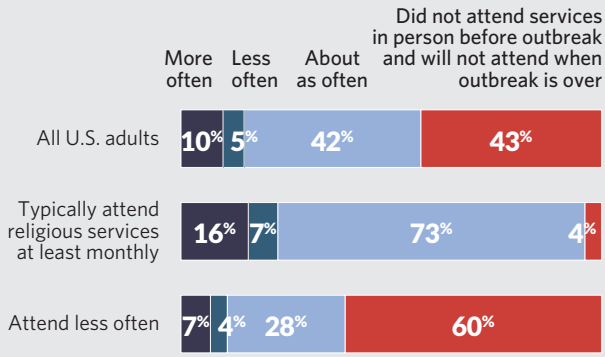
Similarly, a lot of Americans are not interested in virtual services: Two-thirds of U.S. adults say they have not watched religious services online or on TV in the past month. But of the one-third of U.S. adults who recently watched services online or on TV, relatively few (19% of this group, or 6% of all adults) say that once the pandemic is over, they intend to watch religious services more often than they did before it started.

Most online worshippers say that after COVID-19 has passed, they plan to revert to their pre-pandemic habits (18% of all adults) or watch online less often than they did before the outbreak (9%).

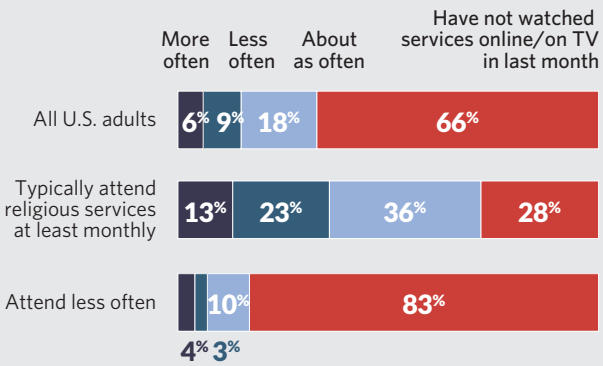
The forecast is even more striking if one looks just at regular attenders from pre-COVID times—the

Few expect pandemic to permanently alter their religious worship routines

% of U.S. adults who say that when the coronavirus outbreak is over, they will attend religious services in person___ than before the outbreak



% of U.S. adults who say that when the coronavirus outbreak is over, they will watch religious services online or on TV___ than before the outbreak



respondents who told us in a 2019 survey that they went to services at least once or twice a month. Of those congregational stalwarts, 92% expect that when the pandemic is fully behind us, they will attend physical services at least as often as they did in the past. This includes 10% who say they will also watch online or on TV more than in the past.

Of course, it is impossible to predict how behavior will actually change after the pandemic, particularly if it extends further into the future than people expect. But, at the moment at least, very few U.S. adults anticipate substituting virtual participation for physical attendance at their church or other house of worship: Just 2% of the pre-pandemic regular attenders think that in the long run they will watch services online or on TV more often —and attend in person less often—than they used to.

Alan Cooperman is director of religion research at the Pew Research Center.

Eric Baradat/AFP via Getty Images

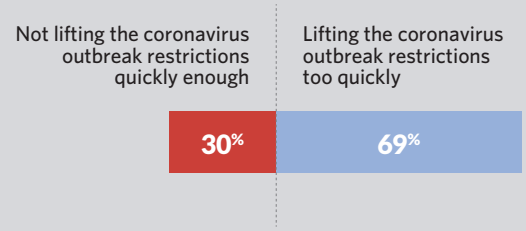
How People View the Impact of the Coronavirus

Since March, the Pew Research Center has been surveying public opinion on a range of topics affected by COVID-19. Here are snapshot views of some recent key findings.

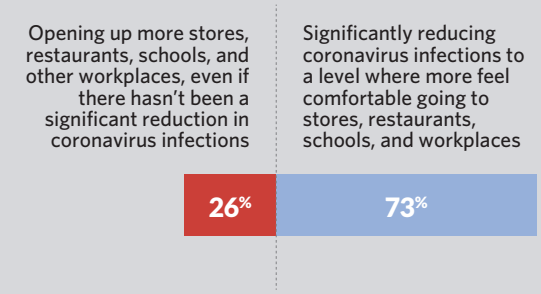
Large share of Americans say COVID-19 restrictions have been lifted too quickly

% who say...

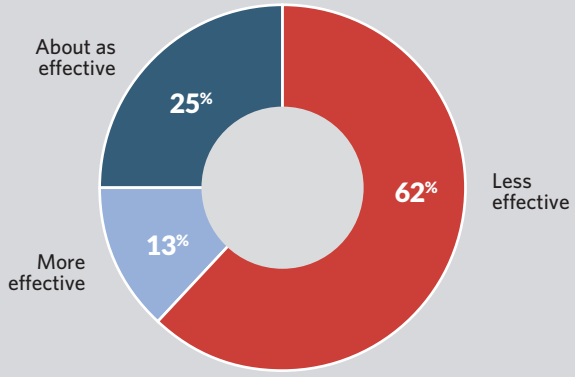
Greater concern is that state governments have been...



More effective way to help the U.S. economy recover is...

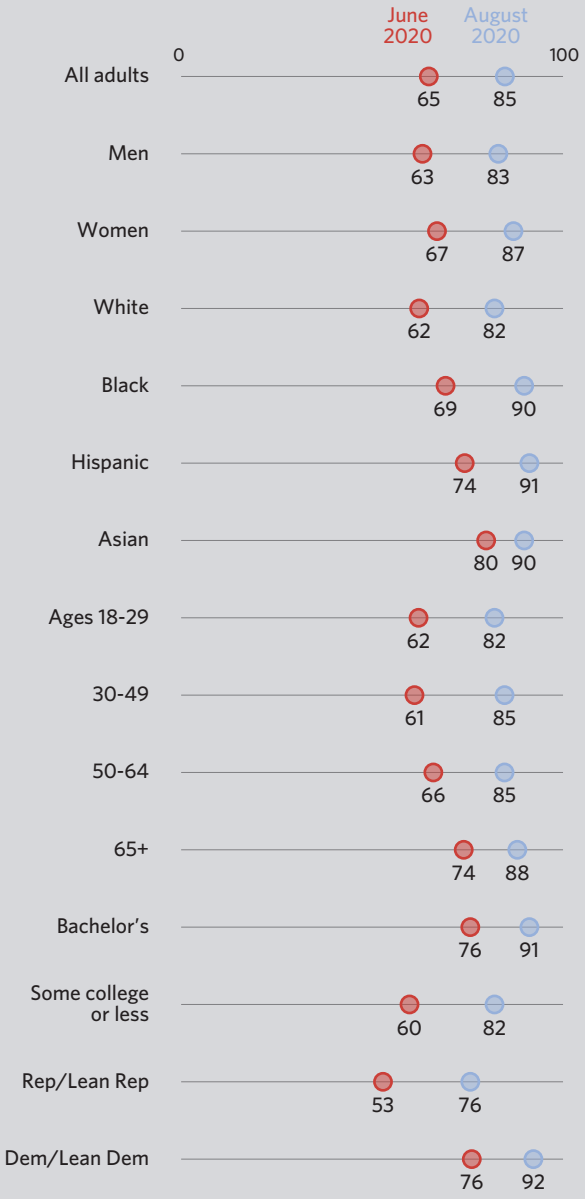


Compared with other wealthy countries, U.S. response to the coronavirus outbreak has been...



Mask use increased in summer months

% who say that, in the past month, they've worn a mask or face covering when in stores or other businesses all or most of the time



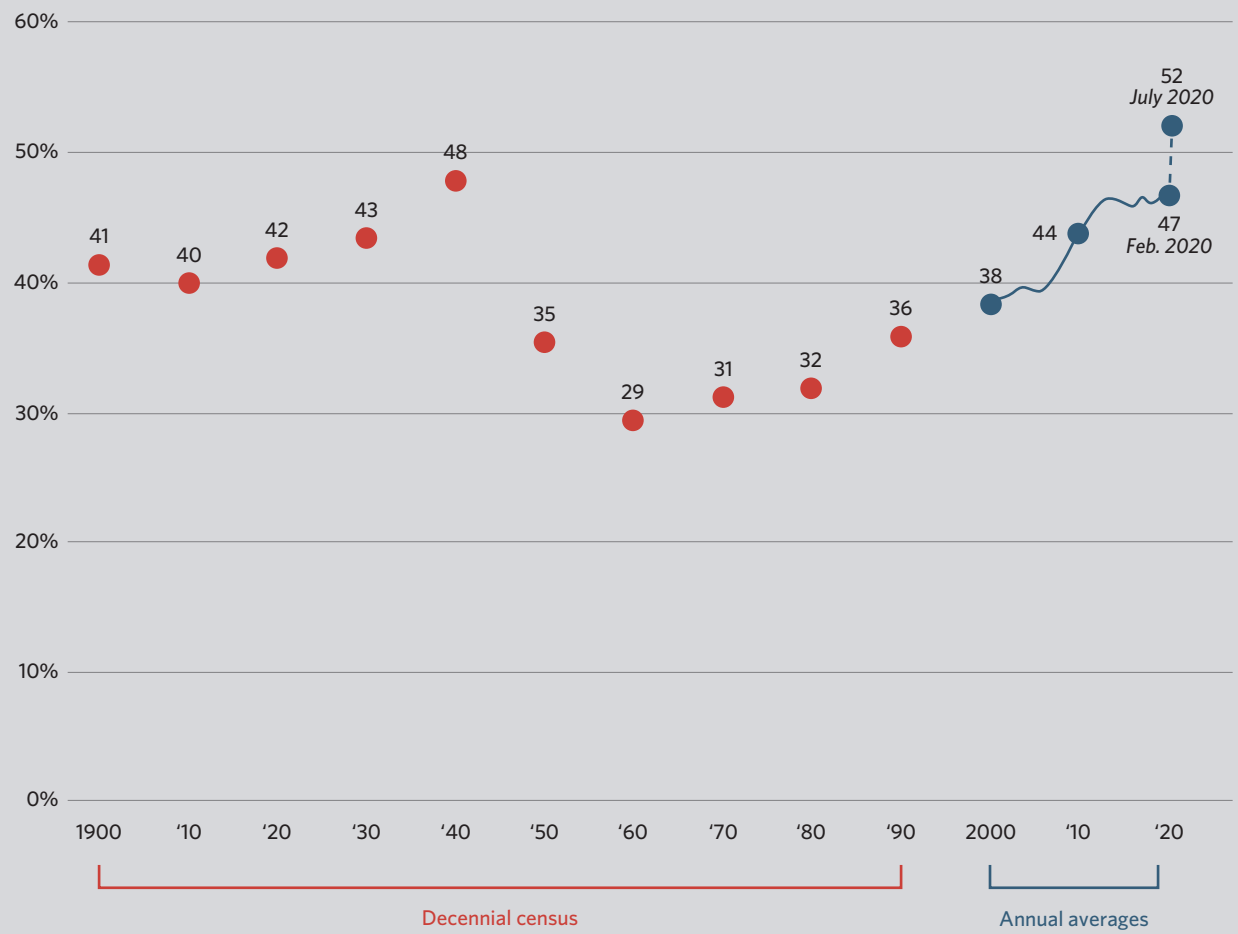
Large majorities frequently watch TV, movies, spend time outside to cope with pandemic

% of U.S. adults who say they do each of the following to help cope with the coronavirus outbreak

	NET Daily/ weekly	*Daily*	*Weekly*	Monthly	Less than monthly	Never
	%	%	%	%	%	%
Watch TV or movies	**89**	*73*	*16*	**3**	**3**	**5**
Spend time outdoors	**84**	*57*	*27*	**4**	**6**	**6**
Talk on the phone or by videoconference with friends or family	**70**	*34*	*36*	**10**	**8**	**12**
Exercise	**64**	*34*	*30*	**7**	**14**	**16**
Pray	**55**	*43*	*12*	**4**	**9**	**31**
Read Scripture	**29**	*17*	*12*	**5**	**13**	**52**
Meditate	**26**	*16*	*10*	**5**	**12**	**57**
Yoga	**8**	*2*	*6*	**3**	**9**	**79**

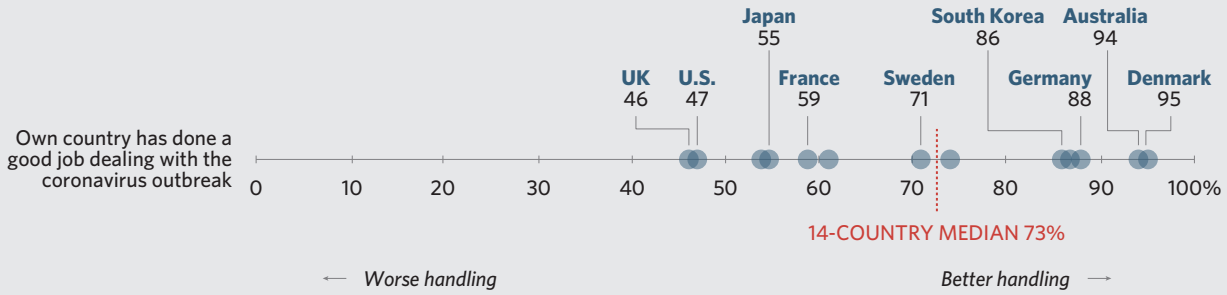
Share of young adults living with parents rises to levels not seen since the Great Depression era

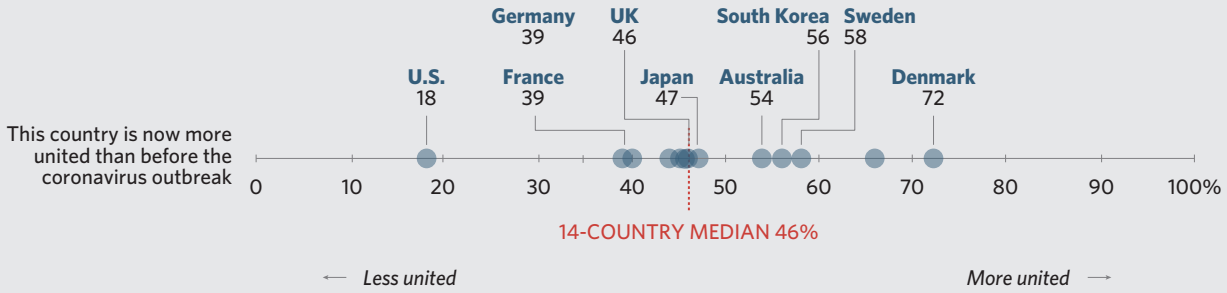
% of 18- to 19-year-olds in U.S. living with a parent



While many say their country's coronavirus response has been good, publics are divided over COVID-19's impact on national unity

% who say...






Roy Rochlin/Getty Images

Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, discusses the science behind the coronavirus on Pew's podcast, "After The Fact." Listen at pewtrusts.org/afterthefact.

CORONAVIRUS

See more coronavirus coverage:

A range of Pew projects are exploring the impact of the coronavirus on their work. Read more about their efforts in the coming pages.

STATELINE

Stateline, an initiative of The Pew Charitable Trusts, is a team of veteran journalists who report and analyze trends in state policy with a focus on fiscal and economic issues, health care, demographics, and the business of government. More stories are available at pewtrusts.org/stateline.

Oji "Chef O" Abbott, left, sits in front of his Washington, D.C., restaurant Oohh's & Aahh's. Studies show that African American-owned businesses, particularly in the service sector such as restaurants, have suffered more from economic and health setbacks caused by COVID-19 than White-owned establishments. *Brendan Smialowski/AFP via Getty Images*

Pandemic Threatens Black Middle-Class Gains

BY TIM HENDERSON

The Black middle class has made strides in recent years toward economic parity with Whites in 34 states, a new Stateline analysis has found.

But the pandemic threatens that progress, as Black professionals and business owners lose their livelihoods at greater rates than their White counterparts.

The middle-class analysis covers changes in household income from 2013 to 2018, the latest year available, based on microdata from the American Community Survey, provided by the University of Minnesota at ipums.org.

The parity varied widely by state.

Among states with at least a 5% Black population, the share of Black households in the middle class

was only 3 percentage points behind their White counterparts in California, Georgia, and Texas. Florida and Maryland had 4-point gaps.

Middle-class income for a three-person family ranges from about $35,000 to $104,000 in Mississippi to about $65,000 to $192,000 in Maryland, the state with the highest median income.

The racial gulf was much wider in Minnesota, at 23 points: 56% of Whites were in the middle class, compared with 33% of Black households. The spread was 21 points in Wisconsin, 17 points in the District of Columbia, and 14 points in Ohio.

The smaller gaps may indicate states with growing job markets where Black professionals have moved in search of opportunity and affordable housing, and with policies that have helped Black businesses thrive, such as loan guarantees and procurement contracts friendlier to small businesses.

The link between Black-owned businesses and the middle class is clear, says Connie Evans, a former board member of the Federal Reserve Bank of Chicago and CEO of the Association for Enterprise Opportunity. Business owners on average build 12 times the net worth of other people, Evans said.

"Entrepreneurship is a critical path to building wealth and building a Black middle class," Evans says.

But storm clouds have gathered for the Black middle class. The number of Black-owned small businesses dropped 41% between February and April, more than twice the rate for White small businesses, according to research provided by Robert Fairlie, an economics professor at the University of California, Santa Cruz.

Even after rebounds in May and June, the number of Black-owned small businesses is down 19% compared with only 5% for White-owned small businesses, Fairlie found.

Fairlie found Black businesses lost more during the pandemic because they tend to concentrate in industries deemed nonessential, with hospitality and personal services like laundry being the most affected.

Minority businesses need immediate financial support to stay in business and long-term policies to make

Masked to comply with rules during the COVID-19 outbreak, Virginia Ali sits near photos of her and her late husband, Ben, at Ben's Chili Bowl, the restaurant they started 62 years ago in Washington, D.C. Initiatives to support African American restaurant owners surged during the anti-racism movement in the U.S. following the death of George Floyd, an unarmed Black man who was killed by a White Minneapolis police officer in May. *Brendan Smialowski/AFP via Getty Images*

Ronnette Taylor sits among sprinkler system parts in her office at Fire Code Design, a company she founded 13 years ago in Boston. Taylor is the first Black woman to run a plumbing and fire protection company in her state, and the first to receive a master plumber's license from a local union, but she struggles to win contracts from the city. *Lane Turner/The Boston Globe via Getty Images*

the banking system fairer to them, says Danyelle Solomon, vice president of race and ethnicity policy at the left-leaning Center for American Progress.

"What COVID has brought out is that they have less resources to keep their doors open and keep operating," Solomon says.

Black college graduates lost jobs in May despite gains for their White counterparts, and even with a rebound in June, their jobs are down 12% from February, according to a Stateline analysis of Current Population Survey data. Losses were high in tech and health care; Black physician jobs are down 18% from February.

And 44% of Black workers said they expected to lose employment income in the next month, compared with 28% of Whites, according to a Census Bureau survey in early July.

Atlanta embodies the rise and fall of recent years.

The city opened its contracts to Black-owned businesses in the 1980s, leading more entrepreneurs to move there, says Eugene Cornelius Jr., a former deputy administrator for the Small Business Administration, now a director at the Milken Institute.

In Atlanta, newcomers found housing more affordable than in the Northeast, and historically Black colleges there provided a pool of business-savvy employees, Cornelius says.

"So Atlanta had a boom, and all those Black resources pulled together to create a middle-class community," Cornelius says. Policies banning affirmative action, such as Proposition 209 in California and the Michigan Civil Rights Initiative, have had the opposite effect and stymied the growth of Black businesses, he says.

The California and Michigan initiatives banned affirmative action in contracts that had been used to help boost minority-owned business. California voters could repeal the measure in November.

Black and other minority-owned businesses do need state and local policies that split up procurement contracts so smaller players have a chance at the business, said Evans of the Association for Enterprise Opportunity. And they need financing help like that provided by California's Capital Access Program for Small Business, she says.

"Black and Brown businesses are not generally multi-

million-dollar companies," Evans says. "They might be able to deliver the quality and the quantity, but they don't have $2 million to put into some performance bond."

But with the pandemic, Atlanta's Black middle class is feeling the effects. Ponder's Cleaners, a Black-family-owned business in southwest Atlanta since 1970, took to GoFundMe in June to plead for contributions to help it stay open.

Business already had slowed because many of the cleaner's customers were from an earlier generation that dressed up more for work and church. They were aging, and younger people weren't as interested in cleaning fine fabrics, sequins, and beaded clothing, the store's specialty.

"When COVID came along and raised its ugly head, we just didn't have enough traffic to sustain," owner Roderick Ponder says. "We'd come in and we'd just be sitting around all day."

The GoFundMe fundraising campaign and mentions on social media, started by a young relative who offered to publicize the store's plight as one of the city's oldest Black-owned businesses, had an immediate effect.

"That was on a Tuesday, and that Wednesday we went in and the phone was ringing and it hasn't stopped. We got business from all over the city," Ponder says. It was an impressive show of solidarity from the city's Black community.

"Everybody needs support. When you see your brother or sister is in trouble, you need to step up," says Ponder. "There are a lot of Black businesses in Atlanta. I say if you can't make it here, you can't make it anywhere. It's the business mecca of the South."

Atlanta's Black physicians also are feeling the pandemic's pinch.

Dr. Taryn Taylor, a pediatrician and assistant professor at Emory University in Atlanta, says many Black physicians lose money because they have a sense of mission about serving imperiled minority communities. That means accepting lower pay.

"It is extremely important that we give back to the community," Taylor says. "A lot of Black physicians are serving populations that are already underserved, so in the midst of this pandemic they are getting lower reimbursement rates."

Since coronavirus deaths are more prevalent in the Black community, patients have avoided visits to their doctor out of fear of infection, hitting Black physicians harder. At Emory, pediatricians were asked to take vacation time when clinics stood empty as patients postponed routine appointments, Taylor says.

Black psychiatrists also have struggled to adapt to the pandemic, says Dr. DeJuan White, a psychiatrist and director of emergency psychiatric services at Emory/Grady Memorial Hospital. Emory has a wealth of technology resources and was able to switch to remote telemedicine services quickly, but smaller Black practices were not.

"We're a hospital system that had that capacity and had some donors to assist with that, but others don't have that," White says. "Even some of our patients were lost to follow-up [visits] because they don't have access to internet. Some do not even have phones."

Black middle-class progress has been fragile and subject to setbacks, as Black residents typically haven't had time to build family wealth. And they may lack connections to get loans and other favors White people take for granted.

"During the last five years and during the Obama administration, we did see the middle-class [Black] community has grown, mainly in the South and some in the West," Cornelius says. "But the supports available for White America are absent from Black America. Blacks are not in the decision-making roles, the ones that decide who gets laid off and who doesn't."

Tim Henderson is a staff writer for Stateline.

Pew Fellows Shift Focus to Boost Chile's COVID-19 Testing

2 alumni discuss their efforts to support national response to coronavirus pandemic

The coronavirus pandemic has touched every corner of the world in unprecedented ways, including Latin America. Chile, for example, had more than 300,000 cases of COVID-19, the disease caused by the SARS-CoV-2 virus, as of July. And as cases continue to rise, the need for quick, effective, and accurate testing is paramount.

Two alumni of the Pew Latin American Fellows Program in the Biomedical Sciences are part of a critical effort to boost testing in Chile. Gloria Arriagada (below, left), a 2007 fellow, and Fernando Bustos (below, right), a 2015 fellow, are researchers and professors at Andrés Bello University in Santiago. Recently, they rapidly converted their university labs to run patient samples in order to identify the presence of SARS-CoV-2 infections.

These two experts recently spoke with Pew about the challenges they've faced in responding to this public health crisis and its impact on their region. Their responses have been edited for length and clarity.

Courtesy of the subjects

What was your research focus before the pandemic and what motivated you to shift to COVID-19 testing?

Arriagada: Before the pandemic, my research focused on the relationship between viruses and their hosts. I was specifically looking at endogenous retroviruses—viral genomes that have integrated into our DNA—and how they can affect cells and contribute to disease.

Our motivation to shift to COVID-19 testing was in response to the Chilean government's call for greater testing capacity. Many hospitals around the country are near capacity attending to COVID-19 patients, requiring them to outsource their testing operations to outside labs. Understanding that the national health care system could not carry this burden alone, the government sought university labs with the right expertise and equipment—including ours—to help meet the demand.

Bustos: My usual research focuses on genes associated with autism spectrum disorder. For example, to learn more about the role of certain genes, I manipulate them using the gene-editing technology CRISPR-Cas9, to see if the resulting phenotype resembles autism.

I returned to Chile in February 2019 after completing my postdoctoral fellowship at the Constantine-Paton Lab at the Massachusetts Institute of Technology (MIT). To put the current testing scenario into perspective, the Broad Institute of MIT and Harvard has the capacity to run about 35,000 COVID-19 tests each day. Comparing this with Chile's daily rate of 12,000-21,000 tests nationwide, we wanted to bolster COVID-19 testing and provide accurate diagnoses as quickly as possible.

What are some of the challenges your labs have faced while converting to COVID-19 testing?

Arriagada: Because our labs focus on academic research instead of running clinical tests, we have faced several challenges in shifting to diagnostic work. First, we had to obtain clearance from the Chilean government and hit the ground running with testing in a matter of two weeks. Second, we have faced administrative barriers because we must input data manually. This limits us to returning about 160 tests each day, but also ensures we can provide same-day results.

But perhaps the greatest challenge is tracking patient data and ensuring accuracy of results. For example, you can run into cross-contamination when one of the samples you're extracting is highly positive and it only takes a tiny drop of the positive sample to alter the negative sample, which can lead to inaccurate results. Knowing this, taking our time to carefully run and review samples is vital.

Bustos: Another great challenge is that for many

A researcher at Andrés Bello University in Santiago, Chile, uses magnetic racks to isolate and purify viral genomes to identify the presence of the SARS-CoV-2 virus, a test that will determine if a patient has COVID-19. Professors Gloria Arriagada and Fernando Bustos converted the university's labs into testing facilities to help the Chilean government increase COVID-19 diagnoses.
Courtesy of Gloria Arriagada

years, there has been a lack of investment in science and research in our country. Therefore, our lab and others in Chile can be limited in what we're able to do and how quickly we can do it because we do not always have the resources we need. As a result, we've had no choice but to be innovative.

For instance, when we no longer had access to N95 medical masks, we had to find ways to protect ourselves from infection while working. Our answer was found in the work of another member of Pew's biomedical network, Manu Prakash, a 2013 Pew biomedical scholar and associate professor at Stanford University. He developed the "Pneumask," a modified snorkel mask, as a form of personal protective equipment or PPE. (More about the Pneumask on page 30.)

Prakash published the instructions to make the mask online—for free—and we were able to print the ventilation port, which acts as a swap-in replacement for the snorkel tube, using a 3D printer. Fortunately, we had recently purchased a 3D printer with funding from Pew, and this mask was a great alternative that made our work more comfortable.

As another example, nationwide, we have had trouble finding sufficient magnetic racks in stock, and, if found, they have been extremely expensive (about US$500 to US$800). These racks are an important tool for isolating and purifying viral genomes from samples so we could run COVID-19 tests. Instead, we designed a similar version that we are able to reproduce with our 3D printer at a lower cost (about US$50) and distribute to diagnostics labs in hospitals and universities across the country.

How has this testing affected your local community?

Arriagada: I believe our testing efforts have made a huge impact, not only on the country's health system, but also to help Chileans understand the significant contributions that scientists can provide. This unprecedented pandemic may help build a case for greater investment in research and science moving forward.

Bustos: When we think about how this pandemic can affect entire families, neighborhoods, or even the region at large, it reminds us of the difference we're making to ensure people aren't circulating the virus and potentially harming others. For instance, many families in less affluent neighborhoods have as many as 20 or 30 people under one roof, meaning that if one person contracts COVID-19, the entire household will likely become infected. So each individual result matters and can have a significant impact on the entire community.

As part of the Pew network, I've met many talented scientists working to advance foundational science and health. Some have inspired me to consider new research interests, especially as a result of the current pandemic, including the need for faster detection technologies for emerging viruses, and greater production of essential resources to support science throughout Chile.

Expanded Telehealth Helps Communities Address Opioid Use Disorder During Pandemic

Practitioners see benefits for patients and providers, especially in rural areas

BY BETH CONNOLLY AND LESLIE PAULSON

Even before the start of the COVID-19 pandemic, only about 1 in 10 Americans with a substance use disorder (SUD) received specialty treatment, which includes care at a hospital, rehabilitation facility, or mental health center. Today, the need to physically distance presents new risks for people seeking these services. Expanding the use of telehealth services can be an effective option to boost access to treatment, especially for opioid use disorder (OUD), while minimizing potential coronavirus exposure.

Declaration of a federal public health emergency in January eased barriers to certain health care services, allowing counseling and prescribing of medications for treating OUD to be provided over the phone and via video chat. It also helped ensure that these services are eligible for Medicaid and Medicare reimbursement.

Many patients are embracing the change, and practitioners note that some people seem more comfortable talking over the phone or video chat than in person.

The speedy and necessary shift to remote care in response to the pandemic may help expand the body of promising evidence for OUD telehealth services. In the meantime, practices across the country are reporting positive outcomes, particularly in maintaining treatment and reaching certain at-risk patients.

Virtual visits are a good fit for many

When people with OUD can access care remotely, they may be more likely to use the services than if they had to travel and take time away from other obligations.

Minnesota-based Hazelden Betty Ford is the largest substance use treatment program in the U.S., but it did not have an official "virtual care" system in place before the pandemic, according to a recent report on "PBS NewsHour." Program staff quickly launched RecoveryGo, which allows patients to be counseled and treated via video chat on a computer, smartphone, or any device with an internet connection and a camera. Early trials have found that the virtual group attendance rate was higher than facility-based groups.

In Jackson County, Oregon, therapists—including substance use counselors—have seen the show-up rate for appointments improve in recent months with greater use of telehealth services. "People don't have to struggle with child care or transportation," Jackie Lien, executive director of the Phoenix Counseling Center, told the local *Mail Tribune* newspaper. "For certain populations, it's a better way to reach them."

Many patients are embracing the change, and practitioners note that some people seem more comfortable talking over the phone or video chat than in person.

Digital connection gets personal

Some clinics are working to provide "coordinated care," a key approach to treating the whole person seeking recovery.

For example, Highmark Inc. and Bright Heart Health, a managed care organization and a provider,

respectively, are linking telehealth and coordinated care to serve OUD patients in Pennsylvania, Delaware, and West Virginia. According to *Coastal Point*, a local newspaper in Delaware, patients can "meet on-demand with medical staff and counselors through a smartphone, tablet or computer," either through self-referral or a "warm hand-off." The latter is a concept of coordinated care that involves transitioning an SUD patient from an initial caregiver, such as an emergency room physician, to a primary care doctor or specialist once the patient is stable.

Telehealth is also allowing providers to connect with people seeking OUD treatment in new ways. Dr. Elizabeth Ryan, associate medical director for REACH Medical in Ithaca, New York, recently wrote that the "insights telehealth has given into the daily lives of our patients have been incredible." She said that staff have been taken "on virtual walking tours of dairy farms, shared work breaks with essential workers, ridden empty buses through distant upstate towns, [and] been shown … tent living conditions." This information can lead to "critical discoveries" for health care workers, for example shedding light on a patient's lack of stable housing, which can make recovery more difficult.

Telehealth links patients and providers in rural areas

Rural areas, where residents may be at high risk for OUD, and regions with lower numbers of clinicians prescribing medications for OUD are especially benefiting from access to virtual treatment during the pandemic.

According to reporting by Interlochen Public Radio in northern Michigan, doctors and patients in the region both felt that it had been too difficult to find medications for OUD. A dearth of doctors able to prescribe buprenorphine, one of the three medications approved by the U.S. Food and Drug Administration to treat OUD, led to long waitlists and drives to clinics an hour or more away. But expanded insurance reimbursement for telehealth visits appears to be encouraging more rural patients and doctors to take advantage of SUD treatment. One local practice reported adding about 20 new patients in a month since starting telehealth services; some of them had been getting treatment at in-patient facilities that had closed, while others had been driving hours to get medication.

In rural Colorado, clinicians at one outpatient treatment center call telehealth a "game-changer." Tony Sullivan, chief clinical officer at Solvista Health in Cañon City, told the Colorado Independent that transportation has historically been a barrier to SUD treatment, "particularly for people who don't have a car or can't get off a snow-covered mountain." After struggling to implement telehealth for more than a year, the clinic was able to transition within two days because of the relaxed federal regulations. For patients who do not have internet access, counselors have been able to provide therapy over the phone, while patients without phones have been given gift cards to purchase them.

Providers acknowledge the critical value of "face-to-face" meetings with patients, even over video chat. This means that the ability to take full advantage of telehealth is contingent on access to broadband internet. In an Alabama Daily News article, leaders of a practice in a rural part of the state estimated that two-thirds of their patients lack an adequate device or internet connection for a virtual appointment. In addition, reporting by North Carolina Health News shows that a community health center serving rural parts of that state is offering creative solutions—such as parking lot appointments—to take advantage of wireless hot spots.

One local practice reported adding about 20 new patients in a month since starting telehealth services; some of them had been getting treatment at in-patient facilities that had closed, while others had been driving hours to get medication.

Although some interventions address the issue temporarily, for telehealth to be effective and narrow the treatment gap long term, policymakers and stakeholders will need to address the disparities that prevent access in some parts of the country.

Expanding telehealth for good

As treatment programs and providers gather additional data on the effectiveness of telehealth approaches to treat people with OUD, policymakers should consider making the federal rules relaxed during the pandemic permanent. Improved access to SUD care—virtual or in person—remains integral to addressing substance misuse and the ongoing opioid crisis.

Beth Connolly is a project director and Leslie Paulson is an officer with The Pew Charitable Trusts' substance use prevention and treatment initiative.

3 Ways to Combat Addiction During and After COVID-19

BY BETH CONNOLLY

A pharmacist at a Baltimore treatment center provides patients with a liquid form of methadone, a medication used to treat opioid use disorder (OUD). To avoid exposure during the COVID-19 pandemic, federal agencies relaxed requirements and are allowing people with OUD to take medication doses to use at home over a period of time instead of having to obtain the drugs in person on a daily basis from providers or treatment facilities. *The Pew Charitable Trusts*

The COVID-19 pandemic has transformed the world seemingly overnight, with most people adhering to physical distancing and self-quarantining measures to protect themselves and others from the coronavirus. But the resulting social isolation can be devastating for people with opioid use disorder (OUD), who often require regular face-to-face interactions with health care providers to manage their chronic condition and who are more susceptible to relapse during times of high stress. In the face of this public health emergency, Congress and the Trump administration can take immediate action to ensure that people with OUD do not put themselves at further risk and continue to receive access to lifesaving care.

First, Congress should pass the Mainstreaming Addiction Treatment Act, which would remove the federal rule requiring all health care providers to undergo training before receiving a waiver from the Drug Enforcement Administration (DEA) to prescribe buprenorphine, one of three Food and Drug Administration-approved medications for OUD, to patients—a hurdle not required for any other prescription drug. In 2018, when only about 26% of people with OUD received any kind of treatment, nearly 20 million Americans lived in counties where no clinician had obtained the required waiver to prescribe the drug.

The COVID-19 pandemic has created unprecedented anxiety and uncertainty for people around the world—feelings that have been linked to increased opioid cravings during past public emergencies.

This lack of access to treatment is partly a result of the training required of providers to obtain the waiver, as well as the additional DEA scrutiny—specifically, random inspections of office records—that comes with obtaining the waiver. These hurdles don't exist everywhere: In France, where clinicians received permission in the mid-1990s to prescribe the drug without additional education or licensing, more than two-thirds of people with OUD received medication, and overdose deaths declined by 79%, in just four years after the practice began. Here at home, members of both the House of Representatives and the Senate have introduced bipartisan versions of the Mainstreaming Addiction Treatment Act that would immediately remove training and licensing barriers and help ensure greater access to effective OUD treatment for people across the country.

Second, federal agencies should permanently relax regulations that require people with OUD to visit treatment providers in person before receiving medication. Temporary changes have been put in place: When the coronavirus began to spread, the Substance Abuse and Mental Health Services Administration (SAMHSA) began allowing patients who usually take daily trips to opioid treatment programs in order to receive methadone—another OUD medication—to take their course of treatment at home for two weeks or longer instead so as to limit face-to-face interaction and potential exposure.

Similarly, the DEA suspended a federal rule requiring patients to meet with a health care provider in person before beginning treatment with buprenorphine; patients are now allowed to have these visits by telephone or video conference. The DEA is also permitting patients to use telehealth for counseling, while the Centers for Medicare & Medicaid Services is expanding reimbursement for these kinds of services.

These temporary changes to long-standing SAMHSA and DEA regulations should be made permanent. Even before the coronavirus, the requirement for in-person visits often created challenges for people with OUD, who may have had difficulty finding transportation or needed to prioritize work or family obligations over an in-person visit. If the relaxed rules remain in place, patients will be able to more easily get the care they need even after the global threat subsides.

Finally, the DEA should expedite the approval of regulations on mobile methadone vans, which can reach patients who are unable to travel to opioid treatment programs. Methadone programs in six states and Puerto Rico use these vans to reach patients, and they can be especially helpful in rural areas where people with OUD might not have treatment options close to home. But the DEA has not approved any new mobile methadone vans since 2007, although the agency did issue draft regulations in February 2020 and accept public comments on the regulations through late April. Now, the DEA must finalize the regulations quickly so that people with OUD—no matter where they live—can more easily get the treatment they need without having to go far from home or take undue risks.

The COVID-19 pandemic has created unprecedented anxiety and uncertainty for people around the world—feelings that have been linked to increased opioid cravings during past public emergencies. And, according to SAMHSA, health care providers should anticipate an increase in demand for treatment during disasters and other times of high stress—such as a pandemic with tens of thousands of Americans dead and millions of others sheltering in place. Congress and the administration must act swiftly to ensure that Americans can receive lifesaving care for OUD without the risk of possibly exposing themselves or others to COVID-19.

A version of this article appeared in The Hill *on May 19, 2020.*

Beth Connolly directs The Pew Charitable Trusts' substance use prevention and treatment initiative.

Americans Who Get News Mainly on Social Media Are Less Knowledgeable and Less Engaged

And social media is now among the most common ways people—particularly young adults—get their political news.

BY TOM INFIELD

How we get our political news can make a big difference in how well-informed we are and in how likely we are to encounter—and believe—misinformation.

A Pew Research Center report published in July shows that Americans who rely primarily on social media for news—which describes about 18% of adults in the U.S.—tend to know less about the 2020 election, less about the coronavirus pandemic, and less about political news in general than people who rely on news websites, cable or network TV, radio, and print.

Those who depend on social media are also more likely than other news consumers to be exposed to made-up news, such as the conspiracy theory that powerful people planned the pandemic and invented the coronavirus in a lab, and to give credence to falsehoods.

These conclusions come from the Center's American News Pathways project, which since last November has been exploring the connection between Americans' news habits and their news awareness. Rather than conducting just a single poll, the news project is taking six deep dives into a pool of nearly 10,000 adults representing a demographic and geographic cross section of the nation who have agreed to periodically be surveyed.

"What the project has done is weave together where people are turning for their news—what their information and news sources are—and how that connects to their perceptions and knowledge about certain events," says Amy Mitchell, the Center's director of journalism research. "It's answering the question: How do people's sense of what's happening in the U.S.—in the world—connect to their information sources?

"The overarching finding," she says, "is that U.S. adults who mainly get their political news through social media tend to be less engaged with news. They follow the news less closely, and they tend to be less knowledgeable on a wide range of current events and broad political-knowledge questions about the U.S."

Over nine months and multiple surveys, Center researchers asked respondents 29 different fact-based questions that touched on a variety of topics related to the news, from economics to President Donald Trump's impeachment and the COVID-19 pandemic. Across the 29 questions, the average proportion that got each question right was lower among Americans who rely most on social media for political news than among those who rely most on other types of news sources (except for local TV).

The percentage of American adults who use social media for news, sometimes or often, is now at 55%, Mitchell says—up from the presidential election of 2016, when 42% of adults got at least some news from social media.

The report also found that just 8% of Americans who prefer social media for news are closely following this year's election, compared with four times as many who get news mainly from cable TV (37%) or print (33%). Only adults who depend on local TV stations for their news are comparable to the social media group in their low attention to the election.

Nearly three-quarters of adults (71%) are active on Facebook, and about half (52%) draw at least some news from there, Mitchell says. The next most important source is YouTube. Other sources include Twitter, Instagram, LinkedIn, Snapchat, and WhatsApp.

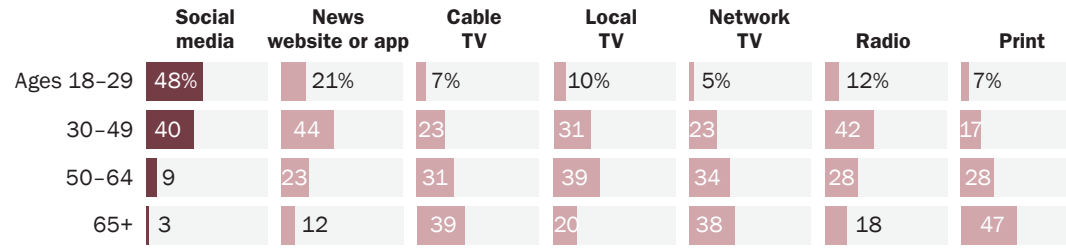
Overall, social media ranks second among all forms of media as a pathway to news, the report says. The 18% who mainly get their news this way compares with 25% who rely on news websites, such as those managed by newspapers, news broadcasters, cable networks, and Internet-only providers.

Cable TV and local TV each are the main pathway for 16% of adults. Network TV comes in next at 13%, followed by radio at 8%. The print version of newspapers (as distinguished from their websites) runs last at 3%.

At the same time that social media usage has increased as a news platform, the credibility of

Those who get most political news from social media most likely to be under 30

Among U.S. adults who say each pathway is the most common way they get political and election news, % who are ...



Source: Survey of U.S. adults conducted Oct. 29–Nov. 11, 2019.
"Americans Who Mainly Get Their News on Social MediaAre Less Engaged, Less Knowledgeable"

PEW RESEARCH CENTER

traditional news sources has eroded, Mitchell says. Center research conducted last year showed that trust in *The New York Times* and *The Washington Post*, to cite two examples, fell significantly from 2014 to 2019, particularly among Republicans.

And demographic factors play a role in who goes where for news, the report says.

Nearly half of the Americans who focus on social media—48%—are under 30 years old, making them Millennials or members of Generation Z. They are, by far, the youngest group.

At the other end of the age spectrum, older Americans are much more likely to turn first to print or cable or network TV. Of adults who say that print is their most common way of getting news, 47% are 65 or older.

Partly because they're young, people who rely primarily on social media for news have lower incomes and are less likely to hold a college degree than people in the other groups, with the exception of the local TV viewers.

"What strikes me is that the people who get most of their political news from local TV are similar in many respects to people who are getting their news from social media," says Eugene Kiely, director of FactCheck.org, a project of the Annenberg Public Policy Center at the University of Pennsylvania that monitors the factual accuracy of national political figures and acts as a self-described "consumer advocate" for voters.

He says that he wonders if many of the social media users would be sitting on the couch watching local TV news were it not for the advent of Facebook. "There are very interesting parallels," he says.

Kiely calls it "very concerning" that the growing cohort of social media users is paying so little attention to the Nov. 3 election, which he says makes them particularly vulnerable to the sort of deliberate misinformation that came in waves in the late stage of the 2016 presidential race.

As of June, more than a quarter of people who rely most on social media had heard "a lot" about the false story that COVID-19 was deliberately or accidentally created in a lab, and 8 in 10 had heard "a little," the report says. Overall, their awareness of this bogus idea was higher than for any other group.

One-third of these people—36%—said they believed the virus came from a lab, and 27% said they weren't sure. Thirty-five percent said the virus came about naturally.

The most comparable group for believing the misinformation about the virus's origins was, again, the group that gets most of its news from local TV. Within this group, 32% said the virus originated, by mistake or on purpose, in a lab.

Users mainly of social media also had heard more than any others about two unproven theories: that vitamin C can be a protection against the virus and that the latest 5G mobile phone technology somehow is linked to the virus.

While the Americans who rely on social media as their primary news source were the most likely to both hear and believe fake news, they were the least likely (except for the local TV group) to worry that misinformation could impact the election, with only 37% saying they were very concerned about such an eventuality.

Kiely says that while the trend toward social media as a major news pathway is sure to accelerate, it's a development that is neither good nor bad on its own. But, he adds, Americans need to better learn—and schools need to teach—media literacy.

"People should understand how news operates—what reputable news organizations do in terms of disclosing their funding, disclosing their financial ties, disclosing their staff biographies," Kiely says. "So much of the misinformation that floats on social media is not attributed to anybody."

Tom Infield is a longtime Philadelphia journalist and frequent contributor to Trust.

Partners for a Sea Change

The Minderoo Foundation of Andrew and Nicola Forrest takes on big issues and earns big results.

BY DEMETRA APOSPOROS

Andrew Forrest, the chairman of Fortescue Metals Group and co-founder of Minderoo Foundation, recently returned to study and completed a Ph.D. in marine ecology at the University of Western Australia. "I realized a few years ago that if I wanted to protect our oceans to the best of my ability in the way I needed to, I had to truly understand and immerse myself in the issues," he says.

It's a hands-on approach to philanthropy that he shares with his wife, Nicola. Through their Minderoo Foundation, launched in 2001, they have championed causes as far-ranging as fighting childhood cancer, supporting early childhood education, creating stronger communities through the arts and culture, and ending global human rights abuses. "Nicola and I are motivated by a strong desire to arrest unfairness wherever we see it, and to create opportunities to better the world," he says. "This underpins Minderoo Foundation, our values, and our philosophy for giving." To date, the couple has set aside 2 billion Australian dollars ($1.4 billion) for the foundation.

In 2013, the Forrests signed the Giving Pledge, championed by Bill and Melinda Gates and Warren Buffett, in which the world's wealthiest individuals promise to give away at least half of their fortunes to charitable causes during their lifetimes or in their wills. The Forrests were the first Australians to sign the pledge and among the first who weren't from the United States.

"Our decision to join the Giving Pledge was driven by a sense of family, love, community, and compassion—and an innate desire to create tangible change," Andrew Forrest says. "We hope our work with Minderoo Foundation, and our commitment to the Giving Pledge, will encourage others to give what they can to causes that mean something to them." The couple's far-reaching efforts and distinguished service have resulted in them both being recognized as an Officer of the Order of Australia, one of the country's highest civilian honors for service to Australia or humanity at large. Andrew received the award in 2017, and Nicola in 2019.

The Minderoo Foundation takes its name from an Aboriginal word meaning permanent and clean water—and Minderoo is also the name of the cattle station in the Pilbara region of Western Australia where Andrew Forrest was raised. As a child, he was in awe of the power and beauty of the natural environment—and acutely aware of how people are dependent upon it for survival. At age 11, a camping trip near the coast left a lasting impression on him when he noticed what appeared to be stars on the ocean and asked his father about them. His father explained that the stars were actually the lights of prawn trawlers as they dredged the sea floor. "I vowed that if ever I had a chance to do something to help the ocean, I would," Forrest says.

He has followed through on that commitment, with much of the foundation's work focused on ocean conservation. Its Flourishing Oceans initiative is geared toward ending overfishing and plastics pollution and developing innovative research platforms and technologies with direct conservation applications. "Our oceans are suffering from overfishing, pollution, and the mounting impacts of climate change," Forrest says. "A key focus of our Flourishing Oceans initiative is to expand global marine protected areas—to safeguard these delicate ecosystems, build resilience, and begin the regeneration of what has been lost. But we know we can't reach our goals alone. That is why collaboration is so important."

A newer component of Minderoo Foundation's ocean work, Sea the Future, targets plastic pollution, which can linger in the ocean for hundreds of years, harming marine life, rivers, and waterways across the globe.

More recently, Forrest has partnered with The Pew Charitable Trusts and Conservation International in the Blue Nature Alliance. The alliance—which includes local and global partners—seeks to accelerate and expand conservation efforts so that 10% of the ocean is protected by 2025. That would mark a significant step toward protecting 30% of the world's ocean

Philanthropists and Minderoo Foundation founders Nicola and Andrew Forrest, shown here in Perth, Western Australia, were the first Australians to sign the Giving Pledge, a promise to give away at least half of their fortunes to charitable causes. Ocean conservation is a large focus of the couple's philanthropy. *Colin Murty/Newspix*

by 2030, which has become the target identified by scientists as essential to helping the ocean rebound.

"Pew has built a terrific reputation over decades for authoritative research and has demonstrated their competence in the expansion of marine protected areas," Forrest says. "When we heard Pew was exploring a new partnership with Conservation International, we got in touch to get on board quick smart. The Blue Nature Alliance is a perfect example of stakeholders from across industries coming together to collaborate—and that's when meaningful change happens."

Forrest stresses that effective philanthropy is not just about bringing money to a problem—funding needs to be matched with unwavering passion, strong ideas, and serious expertise. "At the core of Minderoo Foundation is evidence-based change," he says, "bringing the best knowledge and expertise to solve major global challenges."

That philosophy makes for a good partnership with Pew, which for decades has developed a data-driven, evidence-based approach that brings measurable change in meeting some of society's greatest challenges.

"Andrew Forrest epitomizes the idea that Giving Pledgers should be investing in large-scale, complex problems that require long-term commitments, with a desire to create lasting solutions," says Tom Dillon, Pew's senior vice president for environment."He is a prime example of how philanthropy can be used to cement meaningful change. But more than that, he is actively working to make sure those changes come quickly. We are grateful for our innovative ocean partnership with him."

Demetra Aposporos is the senior editor of Trust.

The History of Evaluation at Pew

How Pew uses evaluation to inform and improve its work.

BY NICOLE TRENTACOSTE

The Pew Charitable Trusts commissioned its first evaluation, hiring external experts to examine its work to highlight successes and failures, in 1985. Since then, evaluation has been an integral part of Pew's approach to philanthropy, helping the organization understand its progress and make decisions about the future direction of its work based on sound, independent analysis. A look at evaluation at Pew shows how it has evolved over time.

The early days

After decades of work using a largely anonymous approach to grantmaking, Pew began to take a more active role in identifying and partnering with grantees to develop programs. By the 1990s Pew had embraced thinking referred to as "strategic philanthropy," which sought to derive greater benefit from every investment of capital, time, and talent, similar to the way that venture capitalists view the world. Except in Pew's case, the return on investment was measured not in profits, but in long-lasting, positive, and powerful benefits to the public.

But how could philanthropic organizations like Pew best measure the public benefit resulting from their investments? Program evaluation, which emerged in the 1960s to assess the effects of publicly funded social programs, held promise for organizations like Pew. Pew began commissioning evaluations—carried out by independent consultants and overseen by internal staff—to examine the performance of individual grants and the collective results of groups of projects.

By 2000, evaluation had become recognized as a valuable tool at Pew, providing information that measured success and informed decisions about a program's direction. Leaders at Pew, and at other philanthropies in the U.S., began to identify ways to better link evaluation with their future planning. Evaluators noted that programs with clear plans of action, informed by systematic analysis, were more likely to see measurable benefits. As a result, evaluation staff were increasingly called upon to provide objective input as strategies were being developed and to help staff articulate clear and measurable goals. The strong link between evaluation and planning remains critical to Pew's work today.

Shift to public charity

After 2003, when Pew changed its status from a private foundation to a public charity, the evaluation unit made additional adjustments to create an approach for work that Pew was directly operating, rather than initiatives run by grantees. As a result, evaluations had to broaden to include and assess Pew's role in implementing program strategy. These types of reviews not only assess whether a program's goals were achieved, but also examine Pew's contributions to any progress observed. We also identified criteria to guide discussions about which initiatives would benefit from evaluation, such as prospects for broader learning; opportunities to inform institutional or program decisions; questions about progress from the board of directors, management, or a donor; investments that were substantial or highly visible; and program or project readiness for evaluation.

Over time, our team has implemented new kinds of evaluations. In addition to reviewing projects that have been at work for several years or more, we have increasingly overseen evaluations that aim to answer questions about the design, implementation, or early progress of a project, aiming to inform its ongoing management and interim decision-making. A recent example is our team's 2019 assessment of Pew's Evaluation Capacity Building Initiative (ECBI), which focuses on enabling Philadelphia-based health and human services organizations to gather and use data more effectively to strengthen their work. The ECBI evaluation, done during the initiative's first two years, helped us understand how it was working and led to several improvements, including changes in the selection and orientation of participating grantees and more training and oversight of those working with grantees.

Learning from evaluations

Pew has long been committed to learning from its evaluations. As Susan K. Urahn—then the director of planning and evaluation and now Pew's president and CEO—explained in 1998, "Besides helping us understand how well we are doing, evaluation gives us the chance to learn from our work. … We have the

obligation to learn from our efforts regardless of the outcome. There is no other way to get better at what we do."

In recent years, philanthropic and nonprofit organizations have increased attention on how evaluation staff could better help organizations apply lessons learned from evaluation activities to inform and improve their program strategies. A 2019 survey of evaluation departments at philanthropies found that the responsibility for organizational learning generally falls to evaluation staff, and nearly three-fourths of respondents said their departments place a high priority on supporting learning. This renewed attention on evaluation's learning potential has offered insights and opportunities to improve Pew's efforts to strengthen our initiatives.

Our team supports staff learning in a variety of ways. For example, we bring together program staff from projects that share similar characteristics to discuss common themes from across our evaluations. After a recent evaluation of our public sector retirement systems work, we brought together leaders from other Pew initiatives aimed at improving government performance to share applicable lessons. One, for instance, was the importance of impartial research and analysis as a tool for Pew to gain credibility and traction in its state work. Other approaches we use to support learning include consulting with staff to help them decide how they will monitor and learn from the implementation of their work, and developing summaries of insights from past evaluations and external literature to inform practices within Pew. Our team has also helped Pew's research initiatives learn about effective ways to strengthen connections between research and policy by sharing findings from prior evaluations with staff and by facilitating discussions about how to apply these findings to their work. We also brought in external experts and supported staff conversations about how to track and measure the progress of research. When possible, we also share relevant findings externally, with Pew's partners and the philanthropy field.

Looking ahead

As Pew continues to evolve, so too will the role of evaluation. For instance, as Pew continues to address challenges that disproportionately affect people of color, including incarceration, juvenile justice, household debt, and access to credit, our unit is examining how our evaluations might be best positioned to support this important work. This means considering, for example, the diversity of our evaluation teams, the cultural appropriateness of our methods, the ability of evaluations to answer questions about the effect of a strategy on historic drivers of inequity, and, when relevant, the inclusion and participation of communities affected by our work.

As Urahn stated some 20 years ago, we have an obligation to learn from our work and adapt based on what we find. The evaluation unit at Pew is committed to helping the institution learn and adapt, and by doing so we contribute to the long-lasting, positive, and powerful benefits to the public that Pew seeks to achieve.

Nicole Trentacoste is The Pew Charitable Trusts' director of evaluation and program learning.

Evaluation Through the Years

1985: Pew's first evaluation, of the Pew Health Policy Program, which provided health policy fellowships through the funding of four university programs, found that the fellowships had a positive influence on participants' training and career paths. For instance, former fellows were filling leadership positions in health policy and reported that the program had substantial influence on the quality and nature of their job performances.

1998: An evaluation of Pew's community development grantmaking in Philadelphia, which had invested $39 million through 71 grants since 1991, found that Pew's support had helped strengthen the community development infrastructure and also revealed small improvements in indicators such as real estate prices and home mortgage approval rates in areas of the city. However, it also found that the strategy was unable to stimulate broad-scale change due to the depth and breadth of challenges in the city as well as grantees' inability to access other sources of funding. Because of this, Pew scaled back its support for community development infrastructure and concluded the program in 2004.

2010: Pew evaluated its U.S. public lands strategy, which launched in 1999 and was initially funded through grants to partner organizations, but evolved to include projects directly operated by Pew. The evaluation found that Pew had made decisive contributions to new administrative and legislative wilderness protections and increased momentum for further reforms. The assessment also noted that Pew was able to effectively recalibrate its strategy in response to challenges in the external environment, and credited the talent and expertise of Pew staff as drivers of success.

How Much Do You Know About Chilean Patagonia?

It's big, largely intact, and needs greater protection—but those are the only hints you get.

From its glaciers and pristine hardwood forests to its rugged coastline and wild fjords, Chile's Patagonia region remains remarkably undisturbed by human activity. Its dramatic and varied features, which include hundreds of islands, estuaries, and channels, provide critical habitat for a variety of plant and wildlife species.

However, these ecosystems and their inhabitants do not enjoy the world-class protections they deserve. That must change, and this decade offers the Chilean government an opportunity to implement proactive conservation measures that can ensure the region's sustainability for years to come.

Take our quiz to find out how much you know about Chilean Patagonia and why it deserves protection.

1. **True or false: Blue whales in Chilean Patagonia have their own dialect.**

a. True
b. False

2. **How many islands are in Chilean Patagonia?**

a. Fewer than 100
b. 1,250
c. 20,000
d. More than 40,000

3. **How many acres are covered by native forest in the Chilean Patagonia national parks network?**

a. There is no native forest in Chilean Patagonia.
b. 1,480 acres
c. 148,000 acres
d. 1.46 million acres

4. **True or false: Chilean Patagonia's coastline is 2.5 times the circumference of Earth.**

a. True
b. False

5. **What percentage of Chilean Patagonia is considered a protected area?**

a. 21%
b. 49.6%
c. 38.5%
d. 62%

6. **How many acres are covered by glaciers in the Chilean Patagonia national parks network?**

a. Less than 5,000 acres
b. More than 210,000 acres
c. Exactly 550,000 acres
d. There are no glaciers in Patagonia.

7. **True or false: Bernardo O'Higgins National Park, one of the 18 in Chilean Patagonia, is larger than Belgium.**

a. True
b. False

Opposite: The Coloane estuary, glaciers, and snow-covered mountains make up a small part of Chile's Hoste Island in Tierra del Fuego, the archipelago at the southernmost tip of South America. *Nicolas Piwonka*

Turn page for answers

Short legs and a stocky build help the huemul navigate steep terrain in the mountains of Cerro Castillo National Reserve, a park known for a conservation program that protects the endangered South American deer. The reserve also offers safe haven for the Andean condor, mountain lions, and the llamalike guanaco. *Tomas Munita*

Answers

1. **True.** After three years of researching the acoustics of blue whales in Patagonia, oceanographer Susannah Buchan, in collaboration with the Chile-based research group Centro Ballena Azul (Blue Whale Center), discovered these cetaceans have unique vocalizations that are unlike any other whale songs recorded in the world.
2. **More than 40,000.** There are 40,001 islands in Chilean Patagonia, of which 32,861, or approximately 82%, are in protected areas.
3. **1.46 million acres.** The national parks of Chilean Patagonia include 1.46 million acres of native forest, including the *Nothofagacae* family of trees—lengas, ñirres, and coigues.
4. **True.** The coastal line of Chilean Patagonia, including its islands, is 62,450 miles long, which is roughly 2.5 times the equatorial circumference of Earth.
5. **49.6%.** Nearly half of Chilean Patagonia—32.96 million acres, an area about the size of Alabama—is designated as a protected area.
6. **More than 210,000 acres.** The 18 national parks in Chilean Patagonia have 210,039 acres of glaciers—70% of the area covered by all South American glaciers.
7. **True.** At more than 8.7 million acres, Bernardo O'Higgins National Park is more than 1 million acres larger than Belgium (7.5 million acres).

RETURN ON INVESTMENT

The Pew Charitable Trusts applies a rigorous, analytical approach to ***improve public policy, inform the public,*** *and* ***invigorate civic life,*** *as these recent accomplishments illustrate.*

IMPROVING PUBLIC POLICY

Flooding swamps a church in Burgaw, North Carolina, in September 2018 after Hurricane Florence. The state's new flood management plan will rely on nature-based solutions to help manage stormwater and mitigate damage. *Hilary Swift/The New York Times/Redux*

A flood resilience plan for North Carolina

North Carolina in June released its Climate Risk Assessment and Resilience Plan to guide the state in addressing the impacts of climate change. The plan contains several Pew-backed recommendations aimed at reducing unsustainable development in flood-prone areas, such as urging state agencies to consider climate conditions before developing in high-risk areas. The plan also recommends that state agencies require or incentivize the use of nature-based solutions to manage stormwater and reduce flood damage. Pew's flood-prepared communities project staff worked closely with state officials, the North Carolina Coastal Federation, and other stakeholders as part of its effort to expand nature-based solutions to prevent flooding.

Nature-based jobs receive funding in Queensland

Queensland Premier Annastacia Palaszczuk announced in July that AU$10 million would go to conservation and land management work in Great Barrier Reef water catchments to provide much-needed employment to help the region recover from the economic slowdown resulting from COVID-19. The funds will allow local organizations in some of the hardest-hit areas of Queensland to support up to 200 temporary nature-based jobs. Earlier this year Pew's Outback to Oceans Australia project convened a national coalition of more than 70 conservation and farming organizations to make the case for economic stimulus in the conservation and land management sector, which the government credited with helping to develop the policy.

New online help for New Jersey stormwater mitigation

In July, New Jersey Future, a nonprofit that advocates smart growth in densely populated areas, unveiled the Stormwater Utility Resource Center, a web resource that helps communities assess fees based on local properties' impervious surface areas to help pay for upgraded stormwater systems and nature-based flood mitigation. The website provides best practices, step-by-step guidance, and sample ordinances and other technical assistance materials that local elected officials can use to implement a stormwater utility fee, a new authority granted to New Jersey cities following the passage of the Clean Stormwater and Flood Reduction Act in March. Pew, which backed the legislation, provided support for the project, including staff who served on the advisory committee for the development of the website.

11th state adopts pension stress testing requirement

In June, North Carolina Governor Roy Cooper (D) signed legislation that requires stress testing of the state's pension system. This analytical tool looks at various economic scenarios and investment returns to provide much better insight into potential long-term liabilities and costs. North Carolina is the 11th state to adopt a formal stress testing requirement, a trend expected to continue as state retirement systems implement new actuarial standards requiring regular assessment of investment, contribution, and other risks. Pew's public sector retirement systems project provided technical assistance and, in 2019, produced a full stress test analysis of the state's retirement system.

Dmitry Bayer/Unsplash

Research reveals opportunities to expand antibiotic stewardship

Open Forum Infectious Diseases, an open-access, online medical journal, in August published results from a survey of primary care physicians' perceptions of antibiotic resistance, inappropriate antibiotic use, and the need for antibiotic stewardship that was conducted by Pew and the American Medical Association. The survey results, as well as focus group research, highlight current barriers to adopting antibiotic stewardship in primary care settings, such as a physician's inability to recognize inappropriate prescribing, and offer approaches for addressing these challenges and encouraging expansion of antibiotic stewardship in outpatient settings nationwide.

INFORMING THE PUBLIC

Concern about climate change

The Pew Research Center published a report in June showing that a majority of Americans continue to say they see the effects of climate change in their own communities and believe that the federal government falls short in its efforts to reduce the impacts. The recent analysis found that 60% view climate change as a major threat to the well-being of the United States, the highest share taking this view in any Pew Research Center survey since 2009. The new national survey, conducted among 10,957 U.S. adults using the Center's online American Trends Panel, finds about two-thirds (65%) of Americans say the federal government is doing too little to reduce the effects of climate change, a view that's about as widely held today as it was last fall.

Brianna Soukup/Portland Press Herald via Getty Images

Trust in the news media

The Pew Research Center in August released a report that capped a year-long exploration into factors related to trust in the news media. The study found that many Americans remain skeptical toward the news media, questioning not only the quality of journalists' work but their intentions behind it. No more than half of U.S. adults have confidence in journalists to act in the best interests of the public or think that other Americans have confidence in the institution. The public is also more likely than not to say that news organizations do not care about the people they report on. And although most Americans (61%) expect the news they get to be accurate, nearly 7 in 10 (69%) think news organizations generally try to cover up mistakes when they happen. The reasons for why Americans think these mistakes happen underscore the distrust that substantial portions of the public feel: Many say that careless reporting (55%) or a desire to mislead the public (44%) are major factors behind significant mistakes in news stories, although other reasons such as the rapid pace of breaking news (53%) also are seen as responsible for mistakes. The study also found that although roughly two-thirds of Americans (63%) think it's better for society if the public is skeptical of the news media, three-quarters of U.S. adults (75%) say it's possible for the public to improve its level of confidence in the news media.

The role of religion, God, and prayer

In July, the Pew Research Center published a report with data from 34 nations on the role that religion, God, and prayer play in people's lives. The study found that a median of 45% of people among the nations polled say a person must believe in God to live a moral life. But answers to the questions varied widely among regions. People in the emerging economies included in this survey tend to be more religious and more likely to consider religion to be important in their lives. They are also more likely than people in this survey who live in advanced economies to say that belief in God is necessary to be moral. Differences occur within countries as well. In general, people who are relatively nonreligious are more inclined than highly religious people in the same countries to say it is not necessary to believe in God to be a moral person. Despite variances in religious observance, a median of 62% across the countries surveyed say that religion plays an important role in their lives, while 61% agree that God plays an important role in their lives and 53% say the same about prayer.


John Price/Unsplash

INVIGORATING CIVIC LIFE

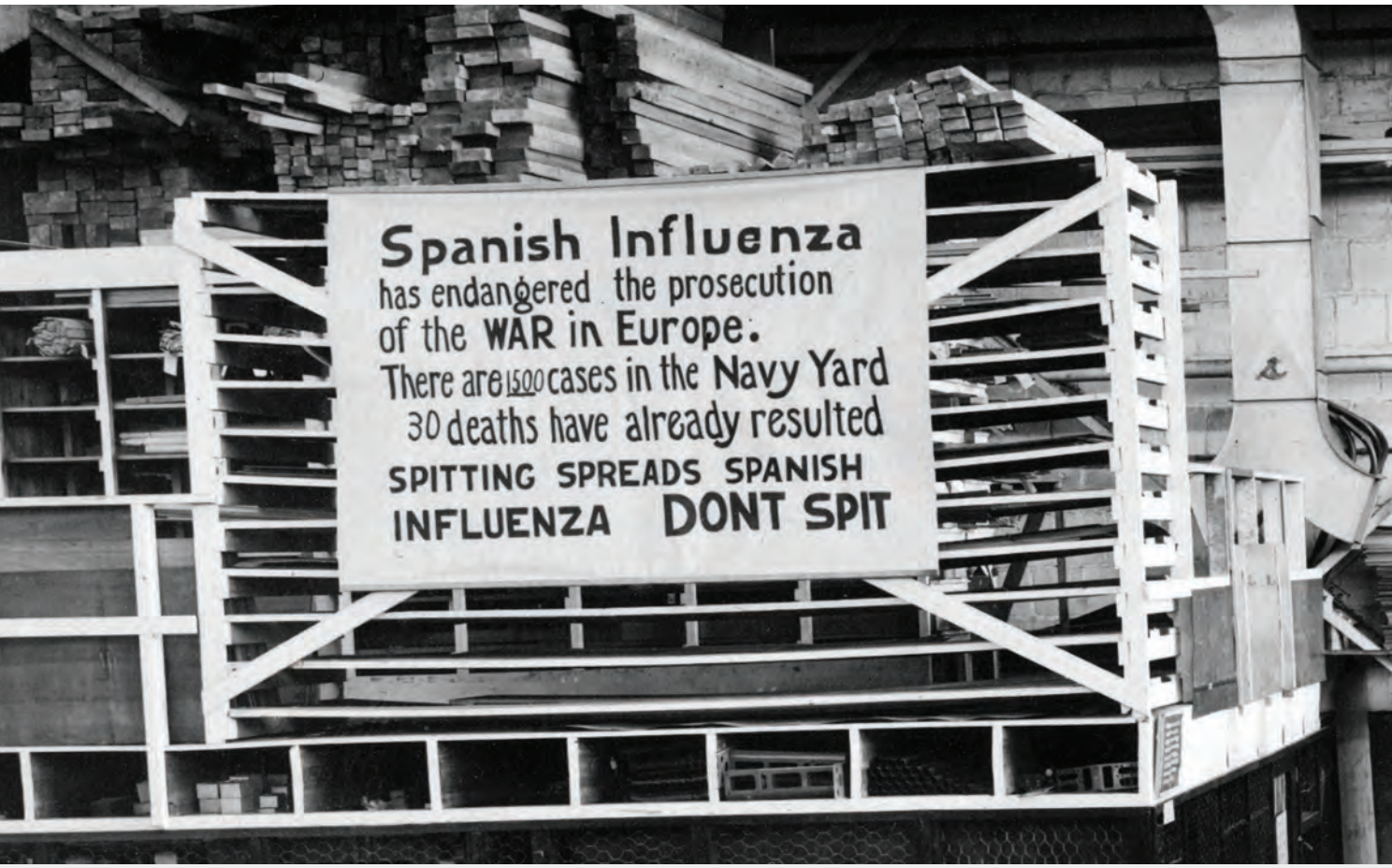
Radio documentary receives regional Murrow award

In May, WXPN's radio documentary "Gospel Roots of Rock and Soul" received a regional Edward R. Murrow Award for best large-market radio news documentary from the Radio Television Digital News Association. Hosted by Grammy-winning gospel singer CeCe Winans, "Gospel Roots" explores the influence of African American gospel on early rock and R&B music and includes interviews with over 50 musicians and gospel historians as well as recordings of live gospel concerts. The four-hour documentary and six-part podcast were part of a larger project funded by the Pew Center for Arts & Heritage that featured several major performances throughout Philadelphia.

Singer Mahalia Jackson performs in 1970. The impact that her gospel singing had on the civil rights movement is one of many subjects covered in the award-winning, four-part radio series "Gospel Roots of Rock and Soul." *David Redfern/Getty Images*

Arabic newspaper is Philadelphia's first in more than a century

In May, artists and resettled people from Iraq and Syria published an Arabic-language newspaper, Philadelphia's first in 118 years. The publication was an extension of a two-year project that brought together Iraqis and Syrians to create books and other artworks that express personal narratives of displacement, immigration, and sanctuary, culminating in a 2019 multisite exhibition. As the project concluded, participants decided to create a newspaper as a way of continuing their collaboration and community engagement. The Pew Center for Arts & Heritage funded the project "Friends, Peace, and Sanctuary," held at Swarthmore College. Philadelphia public radio station WHYY reported in July that 2,500 copies of the first issue of the Friends, Peace, Sanctuary Journal were distributed across the city.



A sign posted at the Naval Aircraft Factory in Philadelphia warns how easily the Spanish flu spread. The 1918 photograph is included in the Mütter Museum's exhibition "Spit Spreads Death: The Influenza Pandemic of 1918-19 in Philadelphia." *U.S. Naval History and Heritage Command via AP Images*

Online arts programming during the pandemic

Projects supported by the Pew Center for Arts & Heritage reached audiences virtually during closures due to COVID-19. The Hurford Center for the Arts and Humanities at Haverford College hosted a studio visit and conversation with the Berlin-based artist collective Slavs and Tatars as part of "The Contest of the Fruits," a project that included a film, a publication, and an array of public programs focusing on cultural heritage and identity. Participants from across the United States, Europe, Canada, and Asia joined Hurford's online event. In addition, the Mütter Museum of the College of Physicians of Philadelphia launched a video tour of the exhibition "Spit Spreads Death: The Influenza Pandemic of 1918-19 in Philadelphia," receiving over 5,100 views in its first two weeks. The museum reopened to the public in July, with limited visitor capacity and advanced, timed tickets required.

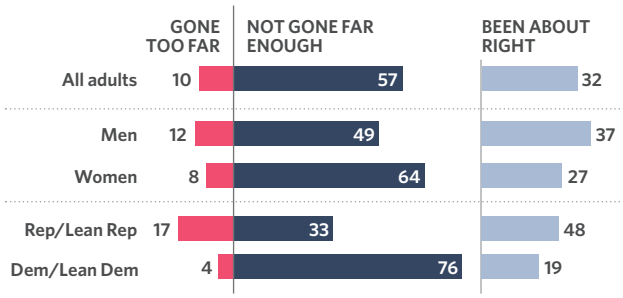
Gaby Bonilla/The Pew Charitable Trusts

100 Years After Women Gained Right to Vote, a Look at Views on Gender Equality

A century after the 19th Amendment was ratified, about half of Americans say granting women the right to vote has been the most important milestone in advancing the position of women in the country—more than passage of equal pay laws, family medical leave requirements, and the availability of birth control. But a majority of U.S. adults say the country hasn't gone far enough when it comes to giving women equal rights with men, according to a Pew Research Center survey released in July.

Views on how far the country has come on gender equality differ widely by gender and by party

% saying, when it comes to giving women equal rights with men, they think our country has...



About half of U.S. adults see women's suffrage as the most important milestone in advancing the position of women

% saying __ has been the most important milestone in advancing the position of women in our country

	Women gaining the right to vote	Passage of the Equal Pay Act	Passage of FMLA	Availability of birth control pill
All adults	49	29	12	8
Men	52	28	11	7
Women	46	30	13	10
Rep/Lean Rep	50	31	13	5
Dem/Lean Dem	48	27	11	11
Among women				
White	49	27	12	11
Black	36	38	17	7
Hispanic	38	36	14	9
Bachelor's+	54	20	9	16
Some college	44	35	13	8
HS or less	40	34	16	6

Note: "FMLA" refers to the Family and Medical Leave Act; share of respondents who didn't offer an answer not shown.

In answers to an open-ended question, equal pay was widely cited as a marker of a society with gender equality

People may have different ideas of what gender equality means. What are some specific things you would expect to see in a society where women have equal rights with men?

	All who say equal rights are important %
NET workplace issues	**53**
Equal pay	45
No discrimination in hiring/promotion, educational opportunities	19
Men and women valued/respected the same in the workplace	5
Better paid leave/maternity/paternity support	2
NET more/equal representation in business/ political leadership	**9**
More/equal representation in business leadership	5
NET more/equal representation in political leadership	**6**
More/equal representation in political office	4
Female president	2
Reproductive rights/autonomy over bodies/ freedom of choice	4
Less traditional gender norms in society	4
No sexual harrasment/sexual violence/violence against women	2
Differences between men and women are embraced/valued/recognized	2
Women in war/joining the draft	1
Men and women sharing housework/childcare	1
Generic equality	11
Other	**5**
No answer	29

Note: Total may exceed 100% because of multiple responses.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Yosemite at sunset, framed by the Wawona Tunnel. The new Great American Outdoors Act benefits all of our national parks.

A Huge Boost for Enduring Places, Page 20

Artur Debat/Getty Images