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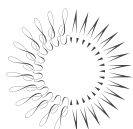
The Pew Charitable Trusts Trust



Fewer Drugs For Them, Better Health For You

Food industry giants take the lead in reducing the overuse of antibiotics in raising chickens.

Summer 2015 | Vol. 17, No. 2



TIME CAPSULE

The Pew Charitable Trusts was founded by two sons and two daughters of Joseph N. Pew, who created Sun Oil Co. With more than 6 million cars on American roads in 1920, Sun Oil opened its first service station in Ardmore, Pennsylvania, and soon owned or controlled 500 filling stations under the familiar name Sunoco. Although the Trusts divested its company holdings in 1997, the Pew family's entrepreneurial spirit and commitment to helping others continues to animate our work today.



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Katye Martens/The Pew Charitable Trusts

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Cover photograph by Nikita Sobolkov, Getty Images

Making Progress With Our Heads and Our Hearts



"I applaud the genius of invention ... the constant development of new ideas in all fields, which, when put to work, represent the only true progress there is."

—J.N. Pew Jr.

The founders of The Pew Charitable Trusts had an abiding belief that science and innovation are essential to moving our nation forward. More than 65 years later, an unwavering commitment to following the truth wherever it leads remains the foundation of Pew's public service mission. We uncover new data through studies in ecology and biology, as well as social science research, and share what we learn with policymakers and the public. And while we dedicate ourselves every day to a rigorous analysis of facts and data, we know we must also persuade and inspire, which means being respectful of the opinions of others and listening more often than we speak.

This issue of *Trust* includes examples of how Pew and our partners, following in the footsteps of our founders, use the power of knowledge to address a range of society's most challenging problems—and the grace of respectful advocacy to bring about change that serves the public interest.

A recent report by the Pew Research Center, based on surveys conducted in cooperation with the American Association for the Advancement of Science, demonstrates that there is often a gap between the views of scientists and the public. While the study revealed the very good news that there is broad support for government investment in scientific research, it also showed that Americans are less positive than they were five years ago about the contribution science makes to society. In addition, the public and researchers sometimes have vastly different views on scientific issues, such as the health effects of genetically modified foods.

For their part, 84 percent of scientists believe that the public simply hasn't learned enough about science to understand the issues, and they see this lack of knowledge as a "major problem." You can read more about the survey in "A Deep Divide."

One of the most important tools for bridging the gap between scientists and the public is effective communication. Researchers should be fearless in reporting the results of their work but also cognizant of the concerns and experiences of people who are not scientists. This requires understanding that Americans bring their own interests, histories, cultures, and values to scientific issues. It also requires a commitment to communicating with patience, diligence, and respect.

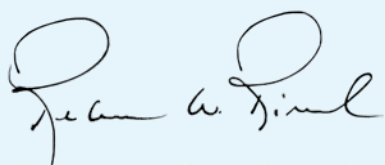
Using these principles, Pew has worked for years to educate the public about the danger of overusing antibiotics. Many antibiotics that we count on to save lives are losing their effectiveness, which is why we have advocated limiting their use in agriculture, to reduce the threat of drug-resistant superbugs to the public's health. And we welcomed the recent decisions by McDonald's and Chick-fil-A to stop purchasing chicken fed with antibiotics that are important to human medicine; Wal-Mart's announcement that it will ask its food suppliers to implement the American Veterinary Medical

Association's principles on the judicious use of antibiotics; and the disclosures by Perdue Farms and Tyson Foods that they will phase out the use of these antibiotics over the next two years. "Serving Up a New Bird" tells the story behind Pew's efforts to curb the overuse of antibiotics by building bridges among scientists, public health experts, policymakers, industry, and consumers—using rigorous research and a respectful appreciation for the views of others.

"Researchers should be fearless in reporting the results of their work but also cognizant of the concerns and experiences of people who are not scientists."

We're also making data-driven progress on a different front. Pew is using information from years of experimentation and best practices to help states develop and implement high-quality home visiting programs. As the story "Bringing Up Baby" explains, good parenting is a learned skill. Pew's evidence-based standards for supporting young couples and first-time parents with information and coaching have been adopted by 11 states that recognize that home visiting reduces health care costs, improves education outcomes, deters crime, and saves taxpayers \$2 for every \$1 invested.

As we learned from our founders, we have an obligation to follow the truth wherever it leads. But uncovering facts is not enough. We must also communicate new ideas and information with patience and clarity, appreciate the diversity of opinions and experiences, and take an open-minded approach to our common challenges. We make great discoveries with the power of our minds. But we make shared progress by respecting what people value in their hearts.



Rebecca W. Rimel, *President and CEO*

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“Browns Canyon and the stretch of the Arkansas River that runs through it are economic powerhouses in central Colorado, drawing people from all over the country for outdoor recreation.”

— Mike Matz, director of Pew’s U.S. public lands project, applauding President Barack Obama’s Feb. 19 designation of the Browns Canyon National Monument

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The waters around Pitcairn Island make up the sixth reserve established with the help of Global Ocean Legacy, which aims for 15 great parks in the sea by 2022. *Danita Delimont/Getty Images*

Pitcairn: Remote, Pristine—and Now Protected

Global Ocean Legacy, a collaboration of Pew and several philanthropic partners, helps win creation of the world's largest marine reserve.

BY JOHN BRILEY

The British government committed to creating the world's largest fully protected marine reserve in March, putting 322,138 square miles (834,334 square kilometers) of the South Pacific around the Pitcairn Islands off-limits to all extractive activity, including fishing.

Pitcairn, an overseas British territory with 51 permanent residents, is one of the world's most

remote islands—the nearest significant land is New Zealand, some 3,000 miles away. That isolation has allowed the island’s waters to remain relatively pristine, with a dazzling diversity of marine life—more than 1,200 species—including 365 kinds of fish, 22 types of whales and dolphins, and what is believed to be the world’s deepest living plant, a species of coralline algae growing 1,253 feet below sea level.

“There’s a growing body of science that shows highly protected marine areas like Pitcairn help support healthy oceans well beyond their boundaries,” says Matt Rand, director of the Global Ocean Legacy project, a collaboration among Pew and several philanthropic partners that advocated for the reserve. “The sea life that breeds in these waters can help sustain fish throughout the ocean.”

Pitcairn is the sixth reserve that Global Ocean Legacy has helped to establish. The project has a goal of creating 15 great parks in the sea—all at least 75,000 square miles (200,000 square kilometers)—by 2022. The others are Papahānaumokuākea Marine National Monument, Marianas Trench Marine National Monument, and expansion of the Pacific Remote Islands National Marine Monument in U.S. waters; the United Kingdom’s Chagos Marine Reserve in the Indian Ocean; and Australia’s Coral Sea Marine Reserve. Global Ocean Legacy’s current

partners include Bloomberg Philanthropies, the Lyda Hill Foundation, Oak Foundation, the Robertson Foundation, the Tiffany & Co. Foundation, and the Waitt Foundation.

The project first identified Pitcairn as a potential location for a marine reserve in 2007 and had been working ever since to build the case for protecting the waters there. Pew staff members traveled to the island—perhaps best-known as the place where mutineers from the HMS Bounty fled and settled in the 18th century—to enlist support.

In 2011, the Pitcairn Island Council, the locally elected governing body, authorized Pew to explore the establishment of a fully protected marine reserve. The islanders played a critical role, some of them traveling to London to meet with UK government leaders. In 2013, Pew and the National Geographic Society joined the council in submitting a proposal calling for establishment of the reserve. And on March 15, 2015, British officials announced their plans to create the reserve.

“The announcement is fantastic news for the future of the sea. Yet despite this great success, only 1 percent of the world’s ocean is fully protected, compared with about 13 percent of Earth’s terrestrial surface,” Rand says. “So we know we still have much to do.”

Two Decades of Helping Kids Become Environmentalists

Ask most kids to join a group that adults dreamed up and there may not be many takers. But tell them they’ll get to spend time outdoors and work in nature and they might jump at the chance. At least that’s what the Denver-based nonprofit Earth Force has found, and its model is helping to develop the next generation of environmental leaders.

Earth Force was launched 20 years ago with a grant from Pew after the Trusts’ Joshua Reichert, now executive vice president for Pew’s environmental projects, saw that young people expressed lots of enthusiasm for environmental causes but were underrepresented in the public environmental debate.

“Children and teenagers have incredible passion for what they believe in,” Reichert says. “We launched

Earth Force to give them the tools and the education they need to drive real environmental change. It’s gratifying to see the organization having such a positive impact.”

Earth Force works with community-based groups to incorporate environmental education material into science classes and after-school programs for students in elementary through high school. The effort has reached more than 300,000 youth around the country.

To give students hands-on experience and mentors, Earth Force partners with a range of organizations, from the private sector to local advocacy groups.

One major partner is General Motors, which provides in-the-field expertise for Earth Force’s GM GREEN program—short for Global Rivers Environmental Education Network, an initiative that teaches young people how to recognize and solve problems in their local watersheds.

GM GREEN is instrumental in 42 of the 50 communities in which Earth Force works, including

Grand Prairie, Texas, where the grounds of Ronald W. Reagan Middle School faced repeated flooding from a creek dammed by beavers. Earth Force students devised a way to reroute the water using PVC piping and ended the flooding without displacing the animals.

The group teaches the mechanics of campaigning that is at the heart of environmental activism. Near Charleston, South Carolina, an Earth Force team of fifth-grade students from Belle Hall Elementary School successfully lobbied officials to include a bike and pedestrian lane on a new 2.5-mile bridge in the city, even traveling to Washington to meet with the group's congressional representatives.

Earth Force also trains environmental educators. More than 70 percent of the teachers who have worked with the group report increased job satisfaction, and 8 in 10 say they've boosted their use of community resources and are better able to emphasize environmental issues in their classrooms.

"Celebrating our 20th anniversary this past year speaks to the need of engaging young people as active environmental leaders," says Earth Force CEO Vince Meldrum. "Pew identified this need in the early 1990s and has championed our investment in young people as environmental problem-solvers to ensure that our communities are adaptable and resilient far into the future."

—John Briley

Ed Fouhy: 1934-2015

Information, Edward M. Fouhy used to say, is the "oxygen of democracy."

The veteran broadcast journalist, who died May 13, began working with The Pew Charitable Trusts more than three decades ago. He sought to find ways to improve the quality of information-gathering so that Americans could be better informed and more effective participants in their communities, the nation, and the world.

In 1994, Fouhy became executive director of the Pew Center for Civic Journalism, which sought to stimulate citizen involvement in society through the news media. Advocates of civic journalism urged reporters to reach out to the public on issues, to listen to how citizens framed their concerns, to hear their ideas for solutions to problems, and to use that information in news stories. He went on to

direct a Pew project that looked at the performance of government in the states and in 1998 became founding editor of Stateline, a Pew initiative that to this day continues to provide reporting and analysis of state-level policy issues.

"Ed Fouhy knew the importance of effective governing in the states and what it meant for the health of the nation," says Pew Executive Vice President Susan K. Urahn. "He was a man of terrific integrity, intelligence, and accomplishment."

Fouhy's endeavors with Pew followed a distinguished career in which he worked for three major broadcast networks. He was Washington bureau chief and vice president for news at CBS, deputy Washington bureau chief at NBC, and Washington bureau chief and vice president for news at ABC. After he left television news, he was recruited by the Commission on Presidential Debates to produce the debates between Michael S. Dukakis and George H.W. Bush in 1988 and among Bill Clinton, Bush, and Ross Perot four years later.

—Daniel LeDuc

Shark Stanley Swims Again

The friendly hammerhead Shark Stanley has returned to the seas, becoming pals with other sharks and rays that need protection—and helping young people around the world understand the importance of global shark conservation.

An updated edition of the colorful children's book "The Adventures of Shark Stanley and Friends," first published in 2012, debuted this spring with a multinational launch that included events in China, the Caribbean, the South Pacific, and the United States. The book prompts its readers to take action to help protect sharks.

The initial edition introduced Shark Stanley and explained why saving sharks should matter to children. Pew's global shark conservation team and other advocates urged young readers to photograph themselves with a cutout Shark Stanley to show support for conservation.

Leah Meth, one of Shark Stanley's creators, says the idea grew out of a collaboration between her graduate program at the Yale University School of Forestry and Environmental Studies and Pew's shark campaign.



Shark Stanley's friends include Tingeman the Tiger Shark, Ballena the Whale Shark, Tala the Thresher, and Waqi the Whitetip. Their adventures help educate children around the world about shark conservation. *Dan Yagmin Jr.*

Meth and Ben Goldfarb wrote the storyline, and Dan Yagmin Jr. drew the illustrations. The original edition was influential during a campaign to secure protection for five species of sharks and two species of rays under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Advocates collected more than 10,000 photos of children from 135 countries with Shark Stanley cutouts to present to CITES delegates.

The campaign was a great success: In 2013, CITES protected oceanic whitetip, porbeagle, and three species of hammerhead sharks, as well as the manta rays.

Meth, Goldfarb, and Yagmin have again collaborated on the new and expanded Shark Stanley book. Meth says the revised book and updated campaign focus more closely on goals in individual countries. "Shark Stanley was such a powerful educational tool, and we really wanted to expand the breadth and scope," says Meth, now an adviser to Pew and an instructor at Yale. "Kids around the world can play a unique

role, whether they're in China looking at the demand side, on an island looking at safe shark sanctuaries, or from a country that could play a role in new trade restrictions. Working together across these themes, we have a holistic view of shark conservation."

The new edition will be available in eight languages. "We've been very careful to both distill the scientific and economic reasons for shark conservation and reflect the important cultural values," Meth says.

Angelo Villagomez, a shark expert with Pew, says Shark Stanley is an effective piece of the program's strategy. "By sharing the updated book and new shark characters, we can ensure that every region and country involved in conservation efforts has a powerful engagement tool to educate all citizens on the value of sharks to their waters," Villagomez says.

—Michael Remez

Copies of the book and the shark cutouts are available at SharkStanley.com.



Philadelphia's Delaware Riverfront is a popular gathering place for the city's millennials, a growing number of whom plan to stay in the city over the next five to 10 years. Yva Momatiuk/John Eastcott/Getty Images

Yo! Philly Feeling Good About Itself

Things are looking up in Philadelphia these days. The population is growing, and crime and unemployment are down. Pope Francis is planning a September visit, and the city will host the Democratic convention in July of next year. And according to a poll commissioned by Pew earlier this year, Philadelphians are more upbeat about the city now than at any time in the past six years.

Nearly half of the poll's respondents—48 percent—say the city is headed in the right direction, compared with only 37 percent who felt that way the last time the poll was conducted, in 2013. While one-third of residents believe the city is on the wrong track, that figure still represents a significant improvement from the 45 percent who felt that way in 2013. Back in 2009, the first year that Pew commissioned a poll of city residents, 46 percent said the city was headed in the right direction, and 37 percent said it was on the wrong track.

Larry Eichel, project director for Pew's Philadelphia research initiative, says the positive attitude is widespread.

"What was most striking was that the change was across the board," he says. "Members of virtually

every demographic group in the poll were feeling substantially better about Philadelphia than they were when we polled them 18 months earlier."

Not only are Philadelphians feeling better about the city, but they're also more likely to stick around. That's particularly true among the city's burgeoning population of millennials. Fifty-nine percent of individuals ages 18 to 34 said they definitely or probably will be living in the city in five or 10 years, up from 50 percent who felt that way in 2013. An even higher percentage of all city residents, 70 percent, said they would recommend the city as a place to live, up from 61 percent in 2013. On the flip side, only 24 percent said they would not recommend the city, down from 31 percent in 2013. In 2009, two-thirds of residents—66 percent—said they would recommend the city, and 27 percent said they would not.

The survey of 1,603 residents was conducted from Jan. 28 to Feb. 19.

Philadelphia still faces major problems, including a school system struggling with money woes and low test scores; underfunded municipal pensions; and a large proportion of people living in poverty.

"Philadelphians have good reason to be optimistic," Eichel says. "The question is whether this positive mood can be harnessed to help the city address its deep-seated challenges."

—Carol Hutchinson

Transportation Needs Are Increasing, but Funding Has Declined

The U.S. transportation system needs a significant makeover to serve a growing population in a nation that is changing how it moves people and goods, Transportation Secretary Anthony Foxx told an audience at Pew's Washington office in April.

With the population expected to increase by 70 million over the next 30 years—with especially strong spikes in some parts of the country—Foxx warned that daily commute times in some metro areas could double unless today's infrastructure is improved.

Changes, he said, must come in five broad categories, all captured in the Transportation Department's report *Beyond Traffic: U.S. DOT's 30-Year Framework for the Future*: how we move; how we transport goods; emerging transportation technologies such as self-driving cars and drones; adapting infrastructure in response to climate change; and determining how to best spend limited budgets to get it all done.

Some of these modifications, of course, are already underway. "Millennials have an entirely different relationship with transportation than did the generations before," Foxx said. They're happy using Zipcar or Uber, are more interested in living in the city center, and much more likely to bike than to ride a bus or drive. "That," he said, "has profound implications for how our transportation system develops."

Foxx spoke at a Pew-hosted event, Navigating Transportation Funding, which also featured the District of Columbia's transportation director, Leif Dormsjo; Virginia's deputy secretary of



U.S. Transportation Secretary Anthony Foxx spoke at a Pew event to discuss the nation's transportation infrastructure needs, saying "there are some things we do together as a society." *Julia Hoppock/The Pew Charitable Trusts*

transportation, Nick Donohue; and Iowa's transportation director, Paul Trombino III.

In introducing the panel discussion, Anne Stauffer, who directs Pew's fiscal federalism program, cited a Pew analysis that showed reduced transportation spending by all levels of government, with federal, state, and local outlays dropping, on average, 12 percent from 2002 to 2012, after adjusting for inflation.

That drop is having a real impact in many jurisdictions. The District's Dormsjo said that many roads in the nation's capital are "drastically deteriorating," adding, "There's just not enough local money to arrest that." Donohue and Trombino voiced similar challenges in stretching available dollars to keep their transportation systems safe, efficient, and responsive to residents' needs.

Foxx called on federal, state, and local officials to ensure that roads, bridges, airports, and rail lines are robust enough to solve tomorrow's transportation problems. What we face today, he said, "isn't a nuts-and-bolts challenge; it isn't a steel-and-concrete challenge. It's a [question] of what we're made of as a country."

With a system in which the funding and administration for aviation is mostly federal, for highways is mostly the states, for transit is mostly local governments, and for freight and rail is mostly with private industry, reforms will require a team effort, he concluded. "There are some things we do together as a society, and infrastructure is one of those things."

—John Briley





SERVING UP A NEW BIRD

Major corporate players McDonald's, Tyson Foods, and Chick-fil-A bring about major changes in the quest to preserve lifesaving antibiotics.

BY AMANDA MASCARELLI

McDonald's has been an American icon for generations, its golden arches familiar to even the youngest of children. Now, the fast-food giant is set to become a symbol of a new and critically important movement in public health. Over the next two years, when Mickey D's customers order chicken sandwiches, Chicken McNuggets, or any other chicken item on the menu, they'll be among the first of the chain's 27 million daily visitors in the United States to get something with a subtle but important difference: The chicken will have been raised without any of the antibiotics that are used in human medicine. The change might go largely unnoticed by McDonald's customers, but the company's decision is a huge victory in the effort to curb the growth of antibiotic-resistant superbugs.

McDonald's is among a handful of high-profile companies, along with some large school districts and hospitals, that are helping to lead a movement to curtail the use of medically important antibiotics in food production. In late April, Tyson Foods, the nation's biggest chicken producer, pledged to stop using human antibiotics in its flocks by the end of September 2017. Tyson raises some 2 billion birds annually, about 21 percent of the U.S. market. In a statement, Tyson says that it stopped using all antibiotics in its 35 broiler chicken hatcheries in 2014 and has scaled back the use of human antibiotics to treat chickens by more than 80 percent since 2011. The company is forming working groups with independent farmers and others in its beef, pork, and turkey supply chains to forge ahead with reducing human antibiotic use in cattle, pigs, and turkeys as well.

McDonald's and Tyson's moves follow last year's promise by the fast-food chain Chick-fil-A to convert 20 percent of its poultry supply to a "no-antibiotics-ever" policy for 2015. The company also is working with its suppliers to make its entire poultry supply antibiotic-free by 2019. Also, in 2014, Perdue Foods, one of the country's leading chicken-processing companies, announced that it was eliminating the

use of antibiotics in its hatcheries. (The company stopped using antibiotics for promoting the growth of its birds in 2007.) In January of this year, Perdue also announced that it has introduced antibiotic-free chicken products for school lunch programs and has committed to a no-antibiotics-ever policy for additional school lunch items sold under various labels.

In late May, Wal-Mart, the nation's largest grocery store chain, said it would ask its poultry, meat, seafood, dairy, and egg suppliers to report annually on their use of antibiotics following the principles of the American Veterinary Medical Association. And in June, the White House convened its first forum on how to combat antibiotic resistance. The meeting, which Pew experts participated in, included 150 food producers, agriculture groups, and public health organizations, and showed a new focus on the issue by the federal government.

"This is unprecedented change in a relatively short amount of time," says Elizabeth Jungman, director of Pew's public health projects. "This changes how chickens will be produced for Americans and marks real progress for consumers' health."

For decades, poultry and meat producers have been using antibiotics that are essential for people's health to help promote the growth of their farm animals. Scientists explain that overuse of these medically important antibiotics enables germs to encounter them repeatedly in the environment and, over time, to become superbugs, by developing mutations that make them resistant to the drugs. People can be exposed to these bugs in soil and groundwater that is fouled with animal waste as well as through contaminated meat.

Since 2008, Pew has been working to raise awareness about the threat antibiotic resistance poses to public health and to encourage policies that phase out the overuse and misuse of these lifesaving drugs. "We're asking animal producers to use antibiotics as a last resort and not the first option," says Gail Hansen, a veterinarian and former

public health officer who works on Pew's antibiotics project. "Right now, antibiotics really are a shortcut, allowing producers to overcrowd animals and keep them in dirty conditions. It's a total waste of lifesaving antibiotics to use them to get the animals to slaughter more quickly."

Pew worked closely with McDonald's prior to the company's recent announcement and has helped forge key relationships with school districts that are changing their chicken-buying habits. "Pew shared their thoughtful point of view on responsible antibiotic use policies, which helped to clarify and reinforce our position," says Jill Manata, vice president for global public affairs and corporate social responsibility engagement at McDonald's. "Our customers want food they feel good about eating and that they know is sourced responsibly. Knowing that this is important to our customers only made our decision easier to make."

EARLY WARNING SIGNALS

Fears about antibiotic resistance date back to the 1940s. Alexander Fleming, the Scottish scientist who won the Nobel Prize in 1945 for his discovery of penicillin, predicted that misuse of his wonder drug in low doses could lead to bacterial resistance. Within a decade, the emergence of penicillin-resistant bacteria proved Fleming's warnings prescient. By 1969, the Swann Report on the use of antibiotics in animal husbandry and veterinary medicine in the United Kingdom documented the growing threat of multidrug antibiotic-resistant bacterial strains. The report concluded that "the use of antimicrobials in food animal production, especially when used in growth promotion, is of great concern and that limiting factors should be put in place to secure the use of antibiotics of greatest importance in human administration for therapeutic uses only and in some cases [exclude them from] animal use altogether."

Half a century later, the reason for concern has become clear. Each year, at least 2 million Americans develop antibiotic-resistant infections, and at least 23,000 people die as a result, according to the Centers for Disease Control and Prevention. Health care experts fear that if the trend goes unchecked, modern antibiotics could become largely ineffective in treating even the most common and curable microbe-borne illnesses.

Ironically, only a fraction of the world's lifesaving antibiotics are used in human medicine. A Pew analysis of data from the U.S. Food and Drug Administration shows that 7.7 million pounds of

antibiotics were sold to treat sick people in 2011, compared with 29.9 million pounds sold for food animal production—a number that rose to 32 million pounds in 2012. An FDA report found that between 2009 and 2013, domestic sales and distribution of medically important antibiotics approved for use in food animal production grew by 20 percent.

Antibiotics have been used in food production in several ways. In chicken hatcheries, antibiotics are injected into eggs to prevent bacteria from getting in during vaccination and causing disease when the chicks hatch. Chicken, cattle, and pigs are routinely fed small amounts of antibiotics to promote growth. Another type of routine antibiotic use in livestock involves feed additives called "ionophores," which are thought to increase feed efficiency by as much as 10 percent. Ionophores are not used in human medicine and have not been found to result in resistance to medically important antibiotics.

Antibiotics also are used in livestock husbandry for veterinary-prescribed treatment of sick animals and flocks. Companies that committed to a no-antibiotics-ever purchasing policy, such as Chick-fil-A, say they will not buy meat from animals that have been treated with antibiotics for the health and welfare of the animals. Treated animals can still be sold in other food supply chains. McDonald's does not have a no-antibiotics-ever policy; instead, the company has committed to avoiding the use of medically important antibiotics and still plans to buy from suppliers that use ionophores for flock maintenance.

"This is unprecedented change in a relatively short amount of time."

Routine use of antibiotics in food animal production began in earnest in the 1950s, when farmers raising domestic livestock for food production observed increased growth rates in chickens and pigs when antibiotics were added to the grain mash. In the 1970s and 1980s, industrialized agriculture intensified the demand for faster-growing animals, which led to an expansion of intensive feedlots and altered the animals' diets, making them more vulnerable to some diseases. This created a surge in the use of antibiotics for both disease prevention and treatment. Maintaining cattle, chickens, and pigs on low doses of antibiotics for growth promotion and disease prevention became the industry's way of doing business.



In addition to eliminating antibiotics from its poultry, McDonald's says it is hopeful about making commitments to reduce antibiotics in its beef products by working with other industry partners. *Bloomberg/Getty Images*

With that in mind, Pew, in partnership with the American Academy of Pediatrics and the Keep Antibiotics Working coalition, created a working group of more than 50 health, medical, and consumer groups to share ideas, forge alliances, and advocate for appropriate animal stewardship and use of antibiotics. The working group has met with FDA experts to spur regulation of antibiotic use in the animal food production industry—some of the first traction on the topic in nearly four decades. Those moves include FDA taking the first steps to end the use of medically important antibiotics for growth promotion by the end of 2016 and to ensure veterinary oversight of all remaining uses in animal feed and water. The next step is further action to address routine antibiotic use for disease prevention or control in healthy animals, according to members of the working group.

Because the livestock industry has been so heavily dependent on antibiotics since the 1950s, phasing them out takes time, Hansen says. "Modern farming in the United States makes such extensive use of antibiotics that it is impossible to separate them out without substantial changes in how we raise food animals."

At Chick-fil-A, the commitment to a no-antibiotics-ever policy has meant rethinking every step of its supply chain, says Rob Dugas, a company vice president. "Our suppliers, in order to provide the volume of chicken that we need, had to go back to the very beginning of the supply chain, starting with the feed, to ensure that there were no antibiotics anywhere in the feed mills, the hatcheries, and the grow houses," and then follow through all the way to the processing plants. That meant changing how far apart the chickens are kept as they grow and how sick birds are separated from healthy ones. "It raised the whole level of thinking in the industry around best practices that might be new and innovative and allow [the suppliers] to continue to

make the margins that they wanted," says Dugas. "All of that coming together is a really daunting challenge."

There is a strong debate within the food-production industry about whether reducing the routine use of antibiotics will result in major costs and other trade-offs. "People are concerned about our ability as an industry to raise chickens with these changes," says Bruce Stewart-Brown, a veterinarian who is senior vice president of food safety, quality, and live operations for Perdue Foods.

He says that since Perdue stopped using antibiotics to promote growth, "our birds grow a little bit slower than other folks' birds." But, he adds, that's a worthwhile trade-off for consumers.

NEW SCHOOL GUIDELINES

It isn't just corporate America that is making major changes to combat antibiotic resistance. Chicken is the leading protein served in schools. "If we can make headway in that particular product, it means a lot in terms of production practices, in terms of nutrition, and in terms of the school food budget really being shifted to more sustainable and healthful products," says Kathy Lawrence, director of strategic development with School Food FOCUS, a New York City-based nonprofit organization that helps schools buy more nutritious and sustainable food.

So three years ago, School Food FOCUS, with research guidance from Pew's

antibiotics project, helped the Chicago Public Schools find a poultry supplier with a surplus of antibiotic-free drumsticks—some 600,000 pounds—that the schools could buy at a low price since drumsticks are not in high demand in grocery stores. That initial purchase was a success, and the school system is continuing to buy antibiotic-free chickens. “It really became, over time and through a lot of work, a match made in heaven,” says Lawrence.

Working with Pew, School Food FOCUS developed new purchasing guidelines for school districts to use when sending out requests for proposals or bids for chicken, to help the schools and the suppliers better understand the issues around antibiotic resistance. School Food FOCUS’s guidelines led to the development of its National Procurement Initiative, in which 15 school districts across the country—serving 2.3 million students—are shifting toward purchasing more healthful, regionally sourced, and sustainably produced school food, beginning with chicken. The initiative, School Food FOCUS, and Pew also helped develop the Certified Responsible Antibiotic Use Standard, the first standard that will be verified by the U.S. Department of Agriculture. It will also require veterinary oversight to determine when prescriptions of medically important antibiotics are needed in poultry production. This identifiable standard allows institutional purchasers to know with certainty how antibiotics were used on the birds when they order chicken. And School Food FOCUS is collaborating with Health Care Without Harm, a national effort to help hospitals buy more sustainable foods.

The combined purchasing power of public schools and hospitals has the potential to have a real impact on the production of chicken and other foods. “Every time a school district or hospital or university starts putting these kinds of guidelines in their bids for chicken or other products,” says Hansen, “it sends a signal out to industry that they’re really going to have to change.”

MORE THAN CHICKENS

But even with corporate America taking the lead and efforts underway in schools and hospitals, Hansen says, there is still need for government action. In December 2013, FDA took some important steps by asking drug companies to voluntarily remove “feed efficiency” and “growth promotion” as acceptable uses from the labels of all antibiotics. FDA officials say that by the end of 2016, antibiotics for growth promotion will no longer be marketed in the U.S.

There is scant data on use of antibiotics. So Pew is urging FDA to monitor and provide public reporting on specifically how and why the drugs are used.

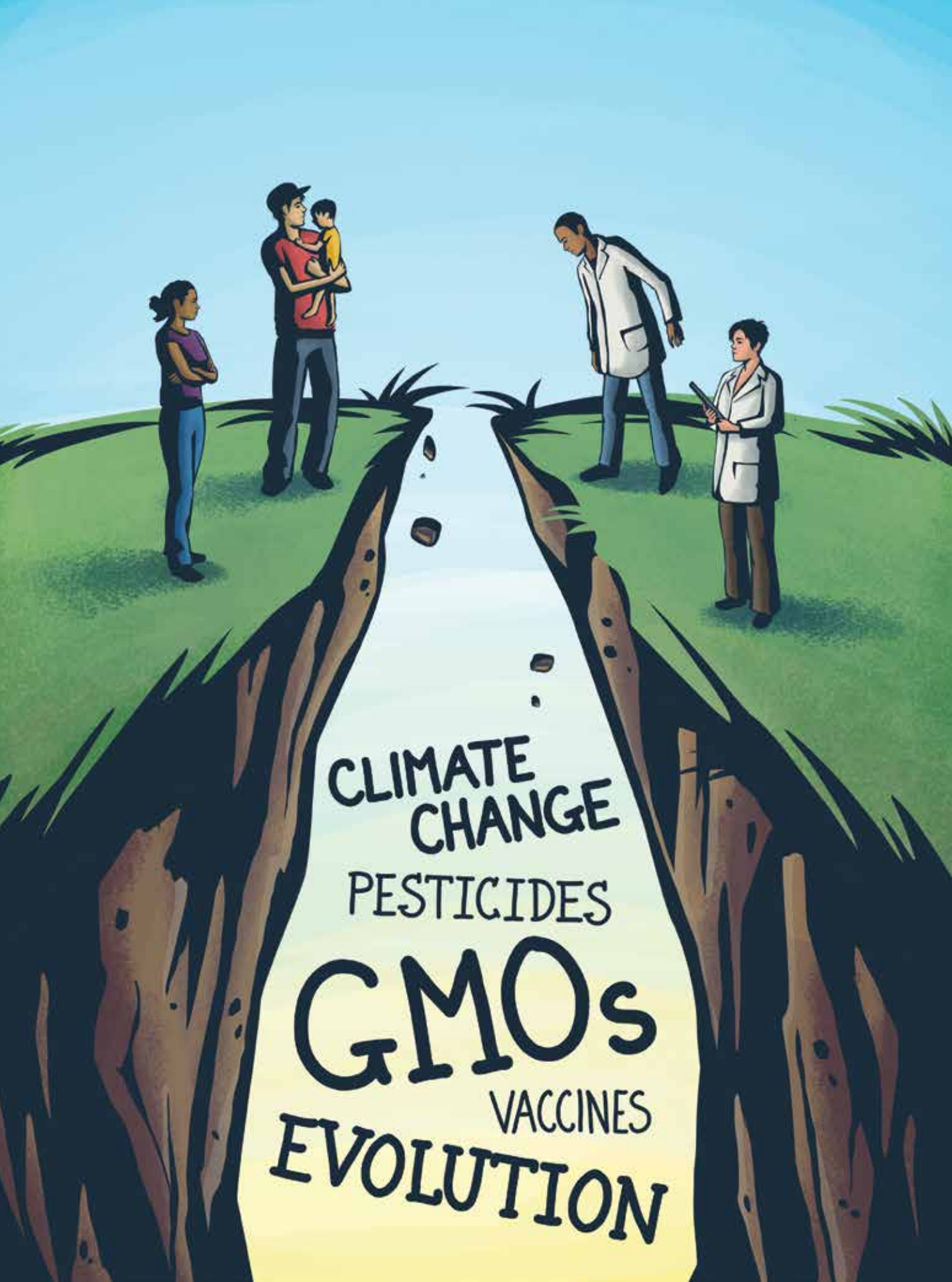
What is happening now in the United States has already been playing out in Europe, where the European Union in 2006 banned the use of medically important antibiotics for growth promotion. The Netherlands, for example, also set specific goals for reducing antibiotic use in food animal production, and by 2012, total sales of antibiotics for food animals dropped by 51 percent.

Pew’s Hansen says the latest developments in the United States are encouraging. Several companies, including McDonald’s, Chick-fil-A, and Tyson, have volunteered to submit themselves to verification audits to ensure that they are fulfilling their antibiotic-use commitments. Tyson was the first company to successfully complete an audit by the USDA, and it plans to sell chickens to the 15 schools in the initiative for the fall semester.

In the long run, preserving lifesaving antibiotics will require more than changing how chickens are grown and must extend to other livestock, including cattle. Tracing antibiotic use is far easier in chickens than in cattle, says Hansen. Most chickens make a one-way journey from the hatcheries where they are born to the farms where their lives come to an end. But after calves are weaned, they move to transition farms and may end up at auction or at other indirect stops before they find themselves in a feedlot. “It’s not going to be as easy as chickens,” Hansen says. “But it can be done.”

Corporate purchasers may again help speed that along. For its part, McDonald’s says it is hopeful about making commitments to reduce antibiotics in its beef products as well by working through the Global Roundtable for Sustainable Beef, an industry partnership that also includes Wal-Mart, Sam’s Club, and other retailers. Marion Gross, senior vice president and chief supply chain officer for McDonald’s North America, says she is optimistic about the possibility of making progress on reducing antibiotic use in beef production. “It’s a huge undertaking, but it is one that we are very passionate about as well,” she says. “It’s not going to be easy, but we’re willing to dig in and see what we can do.”

Science journalist Amanda Mascarelli has written for The Washington Post, Audubon, Nature, and Science.



CLIMATE
CHANGE
PESTICIDES
GMOs
VACCINES
EVOLUTION

Mistrust and suspicion roil the political debate over scientific issues, from evolution and the environment to fracking and vaccines, but several new Pew Research Center studies show that Americans hold scientists in high regard, support government-funded research, and believe science has brought them a better life.

Yet the overall goodwill conceals deep divides between scientists and the public over many topics. These include not only hot-button political and cultural issues but also relatively nonpartisan matters such as the safety of genetically modified foods, the perils of world population growth, and the use of lab animals in research.

And scientists are more pessimistic about America's place in the global scientific community, more worried about the availability of funding, more mistrustful of journalists, and more frustrated about their ability to share their knowledge with the public than they were in a 2009 Pew survey.

A DEEP DIVIDE

As the Pew Research Center launches a new study of science and society, it finds a wide gap between the public and scientists on a variety of issues.

BY GUY GUGLIOTTA

ILLUSTRATION BY NED DRUMMOND

Two core studies, released in January and February, mark the beginning of the center's initiative on science and society. "In the past, our research on science was episodic and came only when people had time to fit it into the other research they were doing," says Lee Rainie, who directs the center's Internet, science, and technology project and co-authored both studies.

"These days, scientific findings are central cultural and civic issues that are especially relevant to how society proceeds in the future," he says. "We've added it as a much more formal part of our research agenda as we move forward."

The first of the two Pew Research Center studies, "Public and Scientists' Views on Science and Society," compares how scientists and citizens approach a variety of topics and explores the role of science in everyday life. This study, described by Rainie as the "showcase" of the new science initiative, announces Pew's intention to survey opinion from both sides of the divide between scientists and the public.

"We have studied public opinion about science for a long time, but it's only recently that we have really started studying scientists' opinion about the public," says Michigan State University's John Besley, a science communications expert who reviewed a draft version of the report. "Pew is focusing not only on public perception of science" but also on scientists "as the ones doing the communicating," Besley adds.

The second study, "How Scientists Engage," explores scientists' views about their role in educating and interacting with the public, either by using journalists as interlocutors or by communicating directly through social media or simply in conversation. Eighty-seven percent of scientists agreed that they should "take an active role in public policy debates related to science and technology" but expressed frustration with what they see as the public's misunderstanding of their work and journalists' inability or unwillingness to present it properly.

Scientists increasingly say they can't sit in ivory towers disengaged from public debates.

Both studies used data gathered from a survey of 3,748 scientists conducted from Sept. 11 to Oct. 13, 2014. The survey used a random sample of U.S. members of the American Association for the Advancement of Science, the world's largest scientific society. The first study also used material from a public survey of 2,002 U.S. adults, interviewed in August 2014. For comparative purposes, Pew designed both studies to mimic as closely as possible the sample used in a similar 2009 survey.

These initial reports will be followed in the coming months by deeper explorations of the survey of the general public, sorting out political and religious views and other factors that influence people's knowledge about science and opinions about scientific issues.

All of this work can be traced to the major gaps between the public and scientists on key policy issues. In some cases, the differences are stark. The first survey showed that only 37 percent of U.S. adults think it's safe to eat genetically modified foods, while 88 percent of scientists think such foods are safe. There was a 42-point gap between the public (47 percent in favor) and scientists (89 percent in favor) on the use of animals in research. Only 28 percent

of the public said it was safe to eat foods grown with pesticides, a statement supported by 68 percent of scientists.

On other issues, the public's views were a bit more positive and closer to scientists' views, but the gaps were still relatively wide. Sixty-five percent of the public agreed that humans have evolved over time, a view supported by 98 percent of scientists. And there was a 37-point gap on the question of whether climate change is human induced, a view supported by 50 percent of the public and 87 percent of scientists. A substantial majority of U.S. adults (68 percent) favor mandatory child vaccines but trail scientists (86 percent) by 18 points.

The differences between scientists' views and those of the public are especially striking because there is such widespread public support for science on questions about its broad impact. The study released in January showed that 54 percent of American adults consider U.S. scientific achievements to be the best in the world or above average when compared with other industrial countries. Only the military (77 percent) received a higher rating among seven sectors of activity.

The survey also found that 79 percent of U.S. adults agree that science has made life easier for most people and has had a positive impact on the quality of health care, food, and the environment. Seventy-two percent of adults said government investment in science and technology pays off in the long run. Seventy-one percent said the same about government investment in basic scientific research, and 61 percent said government investment is essential for scientific progress.

"Public esteem is high, and there's broad support for research funding, even with the current economic problems, and this is good news for science," says physicist E. William Colglazier, a senior scholar at the AAAS's Center for Science Diplomacy, who also reviewed the two studies.

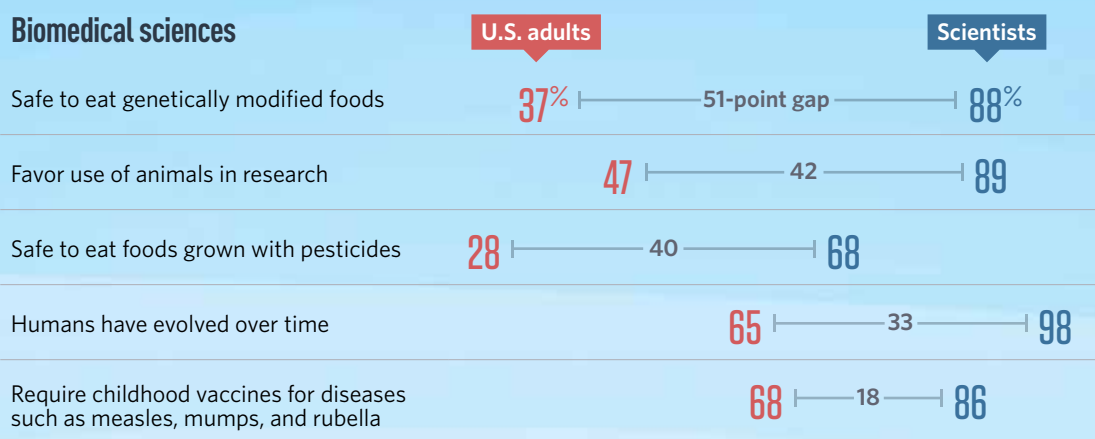
But Colglazier also notes that while 92 percent of U.S. scientists regarded their achievements as best in the world or above average—far higher than the public—only 45 percent regarded those achievements as the world's best. "This was a curious response," Colglazier says. "Based on my own experience talking to scientists from other countries, the U.S. is still viewed hands down as the best."

And Rutgers University public policy expert Cliff Zukin, another reviewer of the studies, expressed some discomfort with the survey's emphasis on

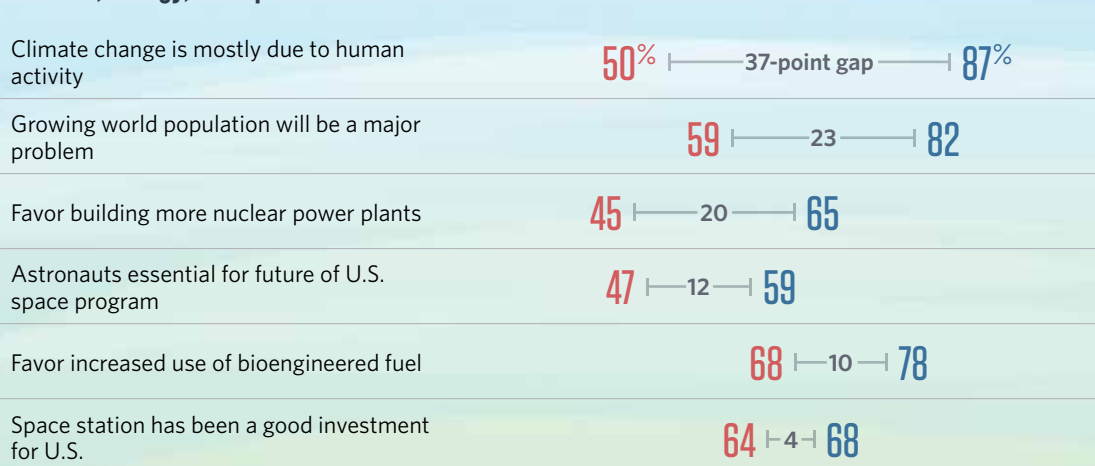
Differences Between the Public and Scientists

Percent of U.S. adults and scientists saying each of the following

Biomedical sciences



Climate, energy, and space sciences





Although 88 percent of scientists say genetically modified foods are safe, only 37 percent of the general public agrees. Many of those opposed take to the streets to voice concerns such as at this protest in Los Angeles. *Robyn Beck/AFP/Getty Images*

the public's 54 percent approval of U.S. scientific achievement, noting that the rating was composed of two modest evaluations: Only 15 percent of the public said U.S. scientific achievement was the world's best, while 39 percent rated it above average. "It's one thing to have these two numbers in a survey," Zukin says. "It's another thing to combine them and call it a positive statement."

The surveys pointed to varying shades of pessimism in other areas. The public viewed the effects of science as overwhelmingly positive for health care, food, and the environment, but the ratings for all three had dropped slightly from 2009 levels.

Among scientists, the 2009 survey showed that 76 percent thought that "now" was "a good time" for science. In the 2014 survey, only 52 percent had a similar view. And although 67 percent of scientists in 2009 said that period was "a good time" to begin a career in their field, the figure dropped to 59 percent in the recent survey.

Colglazier suggests that these and other perceptions of a bleaker scientific climate were "heavily influenced by the recent economic doldrums and tight budgets for funding science." In the survey released in January, 83 percent of scientists said obtaining federal funding was harder today than in

2009, while 45 percent said private industry funding and foundation funding were more difficult to get. Eighty-eight percent of scientists said obtaining funding for basic research was a serious problem.

Funding shortfalls may be one of the reasons that an overwhelming 87 percent of scientists in Pew's second survey agreed that they needed more public interaction. Scientists also said they were troubled by scientific ignorance in the general population, reflected by differences in perception between scientists and the public on a number of important issues.

"There are a variety of things going on. There's no single reason for these gaps," Rainie says. "Are they related to knowledge—lack of interest or lack of learning? Is it political or religious attitudes? Journalists think it's all about polarization. But there's no uniform explanation."

The survey showed that political and religious affiliations were important in questions about evolution and climate change, but there was no similarly easy explanation for public misgivings about genetically modified foods. The survey suggested that people with more education are more likely to be in favor of consuming foods grown with pesticides. On the use of lab animals in research, there was a clear pattern: 62 percent of women opposed it, no matter

their age, education, or income.

Colglazier characterizes the 68 percent public support for childhood vaccines as “very positive,” a sign that people “have paid attention to the scientific evidence on an issue key to protecting their children.” The survey showed that older respondents (78 percent) favored mandatory vaccines in higher numbers than younger people (63 percent among respondents under age 50).

In several instances, scientists turned out to be less enthusiastic than the general public about major issues. Fifty-two percent of the public was in favor of more offshore drilling for oil and gas, versus 32 percent of scientists. Scientists were also more worried (82 percent against 59 percent of U.S. adults) that the growing world population will strain global resources, and more scientists were opposed to fracking, a method of extracting gas and oil from rock (only 31 percent in favor, compared with 39 percent of the public).

“I am somewhat surprised, but I think these views illustrate that scientists are human, too,” Colglazier says. “The scientists’ views on fracking and offshore drilling probably reflect their opinions about mitigating climate change: Their views do not necessarily represent a scientific opinion but would reflect value judgments.”

One subject on which scientists and the public were relatively allied—on the negative side—was the quality of K-12 education in the STEM subjects (science, technology, engineering, and mathematics). Only 29 percent of U.S. adults thought STEM education in this country was the best in the world or above average, and that rating shrank to 16 percent among scientists. Forty-six percent of scientists and 29 percent of the public rated STEM education below average.

Three-quarters of scientists said the poor quality of STEM education was a major factor in the public’s limited knowledge of science. The first survey also showed significant misunderstanding on the part of the public regarding scientific consensus on important subjects. Thirty-seven percent of U.S. adults thought scientists did not agree that human activity is the principal cause of climate change. In fact, 87 percent of AAAS scientists surveyed agree on human-caused climate change. And 29 percent of the public said scientists did not agree on human evolution; actually, 98 percent of scientists said humans have evolved over time.

Questions about scientists’ ability to accurately communicate their views and sway people dominated

the second study on public engagement. Ninety-eight percent of the AAAS scientists said they have at least spoken with the public in conversation about their work, while a majority (51 percent) have spoken with reporters about their findings. Forty-seven percent use social media to discuss science, and 24 percent are bloggers. Not surprisingly, social media are more popular among younger scientists, while older scientists are more likely to talk with reporters. Forty-one percent of scientists engage the public in at least two ways.

But although exposure is important, scientists were not particularly complimentary about journalistic coverage of their work. Seventy-nine percent said news reports “don’t distinguish well-founded findings,” suggesting that journalists have a tendency to give equal weight to opposing views on a particular subject, creating controversy even when the vast majority of scientists are in agreement. Fifty-two percent said the news media “oversimplify findings.” They identified both of these shortcomings as “major problems.”

“I really do think that by keeping things in the news as one side against the other, the public has a more distorted idea of the conflict than there is,” Zukin says. “The media does this point-counterpoint, because if you don’t have it, there’s no story. Because of that reporting style, the public sees science as divided when science isn’t divided.”

Zukin also noted that probably “one-quarter to one-fifth” of the public is interested in a particular scientific discipline, “about the same as politics or baseball. You get to the question of how to increase interest, and I don’t know the answer to that.”

Rainie says the surveys show that “people seek out different kinds of information and believe certain kinds of information,” creating the yawning gaps in perception that dominated both studies. Often these sources promote views that “evolution is an idea,” or “climate change isn’t happening,” he says. “Our next reports will try to parse all these differences—education, demographics, religion, politics.”

Although scientists may have some understanding of public perception, they “are increasingly worried that they aren’t at the front of these conversations,” he says. “There is a growing sense among them that they can’t sit apart in ivory towers.”

Guy Gugliotta’s science writing has appeared in The New York Times, The Washington Post, Smithsonian, National Geographic, and many other publications.



Bringing Up Baby

—— Instructions Now Included ——



Annai Burrola of United Way of Santa Fe County in New Mexico visits first-time mother Sarahy and her year-old daughter Elisha.

For parents who need extra help, family support and coaching are now stronger than ever.

Story by Jodi Enda and photos by Katye Martens

Maia Cortisoz was still in pain from her cesarean section and emergency follow-up surgery when a stranger walked into her hospital room and handed her a packet. “She said, ‘If you want to sign up for this program, we will come to your house every week,’” Cortisoz recalls.

The new mother of twin girls Thalía and Raquel had no idea at the time how much she would come to rely on the regular visits by nurses from the United Way of Santa Fe County in New Mexico. But in the ensuing months and years, as she struggled to care for her daughters while recovering from surgery that initially left her unable to nurse, battling severe postpartum depression, and coping with a layoff from her job, Cortisoz viewed the visits as a lifeline.

“It was a rough start for us, with the birth, the inability to nurse, then losing my job. Some days I was great and some days I was a sobbing mess,” says Cortisoz, now 33. But when the nurse visited, “she always had some sort of idea to help me out.”

Cortisoz frequently talks about how much nurses from the United Way helped her and her partner, Jesse Sandin, survive their difficult first years as parents. At the United Way office, where she now works as a researcher and data analyst, she shares her story with other new parents who might benefit from home visits, and also with potential donors. “We used a picture of the twins and us in the United Way holiday card last year—as a success story,” she says proudly.

Cortisoz and Sandin are among thousands of parents around the country who have benefited from home visits provided by government-funded, locally implemented family support and coaching programs. Although the programs have been offered in some states for nearly three decades, they became more accessible when the Bush administration allocated federal money for them in 2008. They got another boost in 2010 when the Obama administration created the Maternal, Infant, and Early Childhood Home Visiting program.

This federal-state partnership establishes standards while allowing states and local communities to set their own goals and tailor the program to the needs of their residents. Some jurisdictions offer prenatal care, some focus on getting children ready for kindergarten, and others help vulnerable families become more resilient, better able to handle stress, and more self-sufficient. Altogether, the Department of Health and Human Services has approved 17 evidence-based programs to provide assistance for some period from the time a woman becomes pregnant until her child turns five. The models have a few things in common: They are based on scientific research, they are voluntary, and they aim to help vulnerable families during the first, often stressful years of a child’s life.

Family coaching teaches parents about their babies’ health, developmental milestones, nutrition, and breastfeeding, says Katherine Freeman, president and CEO of the United Way of Santa Fe County. “We’ve also seen very early identification of developmental delays,” she says. “If treated in the very first year of a child’s life, these delays can be easy to deal with. But if they’re not identified until later on, they could be heartbreaking.”

Freeman credits the state’s home visiting program, which receives significant philanthropic support, with helping to identify such serious problems as substance abuse, child abuse, and postpartum depression.

For seven years, The Pew Charitable Trusts has collaborated with state and federal officials, family advocates, and nonprofit organizations to raise awareness about the need for support and coaching programs. It has worked to increase the programs’ effectiveness and accountability and to help them attract government and private investment.

Pew also has assisted 11 states in enacting laws requiring that publicly funded home visiting programs have a proven record of effectiveness, clearly articulate the investment goals, and most importantly, measure results.



Jessica Apodaca of the United Way of Santa Fe County, right, meets with first-time mother Lucy, who had heard about home visiting help from a friend when pregnant with Elise. They will continue to get together once a week until Elise is 3, measuring her development to ensure she is growing cognitively, socially, and emotionally.

“We helped states develop and enact policy that enhances the overall quality of the home visiting network,” explains Karen Kavanaugh, director of Pew’s work on family support and coaching. “States didn’t always know who they were serving or what they hoped to achieve. We helped them set their goals so they knew if they were being successful.”

Once a state passes legislation, she says, Pew helps advocate to secure additional appropriations to

finance the programs.

In April, Pew helped to persuade Congress to extend the Maternal, Infant, and Early Childhood Home Visiting program for two years at \$400 million each year. The legislation drew strong bipartisan support in the Senate and the House.

“I’m absolutely convinced that for many, many parents, these programs are essential for strengthening families and making them resilient,”



Lucy and her husband, Okwen, have come to rely on their weekly home visiting sessions to help them with Elise. “We did the birth preparation and even parenting preparation classes, but now that we’re in the thick of it, we feel very grateful to have someone who checks in and brings back our big picture perspective,” she says.

says Kavanaugh. “When I think about the isolation that many of these families experience, it really makes a difference to have someone who comes in in a trusting relationship, a consistent relationship, and helps parents.”

Research shows that quality family support and coaching programs—often called home visiting programs because they take place in the home—ultimately reduce health care costs, lessen the need for

remedial education, and increase self-sufficiency within families. The programs also are a wise investment in the long run: For each dollar allocated to home visits, taxpayers save \$2 in future government spending.

“The Pew campaign started after the analysis that home visiting programs were a very good investment, both in terms of achieving child and family outcomes and saving taxpayers money,” Kavanaugh says.

She says Pew’s work has received support from law

enforcement officials, who view home visits as a way to reduce child abuse and neglect; from the business community, which sees them as a way to ensure that children receive the education they need to succeed in school and eventually the workforce; and from state officials, who look to the programs to offer needed support to families.

"I'm a real believer in getting involved with families early on," says James Haveman, who recently retired as director of the Michigan Department of Community Health. Family support and coaching "used to be done by neighbors and other family members. So much of that's missing these days, and many young women and men need help with parenting and education and decisions about [whether to have] a second child." In Michigan, he says, "Home visitation does a lot from early on to 3 years old, where so many formative things happen."

Michigan spent \$11.7 million to provide home visits to 40,000 families in the fiscal year that ended Sept. 30 and has committed \$14 million in the current fiscal year. "We're so enamored of this program that the governor [Rick Snyder] started what he's calling the Michigan Partners for Success" to attract foundation money and increase home visits further, Haveman says.

Michigan aims to reduce premature births, infant mortality, and child maltreatment and to improve school readiness and family self-sufficiency.

"There's a lot we can do to have healthy families and healthy kids," says Haveman, who earlier in his career was appointed by President George W. Bush to build a health care system in Iraq. "The home visitation program is a cornerstone for us."

Pew also worked with the New Mexico Early Childhood Development Partnership, a division of the United Way of Santa Fe County, to advocate for the state's Legislature passage of the Home Visiting Accountability Act in 2013. The law sets quality standards for home visiting programs and measures how well those programs perform.

Although New Mexico offers home visits to all first-time parents, the services are especially essential

to the high proportion of New Mexican families living in poverty, says Claire Dudley Chavez, director of the New Mexico Early Childhood Development Partnership. From 2011 to 2013, the largely rural state with a vibrant tribal community had the highest poverty rate in the nation: 21.4 percent, according to a 2014 U.S. Census Bureau analysis.

Now, in partnership with the Santa Fe-based Thornburg Foundation, Pew is working to strengthen the outreach of the programs, conducting interviews and focus groups to learn how to reach more families. (See *Trust*, Winter 2015.)

When Pew began to work on family support and coaching in 2008, it set out, as the institution often does, to be a catalyst for change by establishing specific goals that would have a lasting impact.

Those objectives included ensuring federal funding, increasing state funding, creating accountability measurement in at least 11 states, and directing revenue toward programs with a proven record of effectiveness.

Having achieved the federal and state funding and created more effective home visiting systems in the 11 states, Pew will transition out of the field this fall, but not before it completes work on its latest project, the Home Visiting Data for Performance Initiative, to help states track and measure outcomes. Pew is working with those states and Los Angeles County to create a concise list of indicators that would provide solid data to help those working in the field to improve the health, safety, and school-readiness of children.

"Creating a strong measurement of what works and what doesn't in helping young parents will in many ways be our strongest legacy in this field," says Kavanaugh. "Real, positive change for American families has resulted from these programs, and we want to ensure that lasts."

Jodi Enda is a Washington-based journalist who has written extensively for Trust about Pew's work in the states.

Pew worked with **Arkansas, Connecticut, Iowa, Kentucky, Maryland, Michigan, New Mexico, Ohio, Oklahoma, Texas, and Vermont** to enact laws ensuring that their home visiting programs produce positive results for new parents and their babies and a solid return on taxpayers' investment.



JUST BELOW THE SURFACE

Photographer Paul Dabill gets up close to some of the smallest but most important fish in the sea—by holding his breath.





Above: **Forage fish**, such as these cigar minnows darting through shadowy waters under a South Florida pier, are in high demand globally as feed for fish farms and livestock and for use in cosmetics, pet food, and fertilizer.

Opposite top: **Paul Dabill** typically holds his breath for 90 seconds, positioning himself for the best photo angles. Without scuba gear and the bubbles it generates, he doesn't scare away the fish.

Right: **The tight schooling** of forage fish makes them easy targets for nets and leaves them vulnerable to overfishing.

PHOTOGRAPHY BY PAUL DABILL

In a single breath, Paul Dabill can dive beneath the waves, sneak up on ocean animals, and snap captivating images of underwater life.

A self-taught nature photographer and trained free diver, Dabill captures the interplay between predators

and prey that is critical to healthy oceans. Through his work, the South Florida resident is adding to efforts by Pew, scientists, fishermen, and conservationists to protect prey species such as mullets and sardines. These small creatures, known as forage fish, are a



vital food source for animals ranging from whales to king mackerel, but they are increasingly being caught for use as feed for fish farms and livestock and as ingredients in consumer products such as cosmetics, pet food, and fertilizers.

"If my photographs spark interest and educate, then I think people will come to value the oceans even more," says Dabill, 40, who lives near Palm Beach. "I think the underwater world is beautiful and stunning. To capture a moment, relive it, and share it with others is a process that I find very satisfying and will hopefully make a difference."

As a free diver, Dabill typically holds his breath for 90 seconds at a time while positioning himself to get the best photo angles. Although he can hold his breath for five minutes underwater while staying still, the shorter duration means he can continue to dive for hours without getting tired. Dabill says free diving lets him get closer to wildlife than some other underwater photographers are able to do, because he can move faster without scuba equipment and the animals aren't driven away by air tank bubbles.

He shoots most of his photos off the southeastern Florida coast in shallow water to make use of natural light. Years of fishing experience have given him a good feel for where to find marine life. His over-and-under photos—in which half of the picture is taken underwater and half is above the water—help him to communicate how humans are linked with a marine environment that is close to land but often out of sight.

"I want people to realize that we still have this wealth of nature," he says, "and our job now is to protect it for future generations."

—Debbie Salamone

Mulletts rely on safety in numbers, overwhelming bigger fish like this tarpon and leaving them unable to attack. Predators of forage fish usually catch just one every 10 bites.





Gotcha: Satellites Help Strip Seafood Pirates of their Booty

BY CHRISTOPHER JOYCE

Most of the seafood Americans eat comes from abroad. And a lot of that is caught illegally — by vessels that ignore catch limits, or that fish in areas off-limits to fishing.

No one knows how much of it is illegal, because the oceans are too big to patrol. Or at least, they were. Now environmental groups have harnessed satellite technology to watch pirate fishing vessels from space. And they've caught some of them.

Environmental groups, as well as the U.S. government, say pirate fishing endangers fish stocks and undercuts U.S. fishing fleets that follow the rules.

But consumers care as well. And so do the people who supply them.

ProFish is a big seafood distributor in Washington, D.C. It's in a part of town tourists never see — in a compound of brick warehouses. Inside, in a maze of high-ceilinged rooms, workers in waterproof overalls filet fish on cutting tables and hose down cement floors. Giant refrigeration units keep the place numbingly cold.

John Rorapaugh is the sustainability director at ProFish. Rorapaugh says sustainable seafood is caught or farmed in a "responsible" way that doesn't threaten fish populations or harm the environment. His fish lie in tubs of crushed ice: steel-colored tuna and glittering striped bass. There's a fish with a yellow stripe like a Nike swoosh.

"Mahi mahi," he says, in a tone you might use to describe show horses. "You should see it when it comes out of the water. It is just the most beautiful fish." Rorapaugh says to assure its pedigree as sustainable, a fish needs a story: its genus and species, who caught it, when and where it was caught. Rorapaugh says fish caught in the U.S. come with that information, but imported seafood usually does not.

"God forbid you ask where it was caught, and

most people, by the time it gets to us, they have no idea," he says. I ask if he would like to have that information from importers. "Of course. I would love to see more chain of custody," Rorapaugh says. "And I think that's what the consumer wants. We're seeing that people want to buy fish that have a story, that are sustainable and clearly are legal." He notes that those people are the high end of the market, not the ones who buy frozen fish sticks at the supermarket. But he says more people are asking about the kind of fish they're getting and how it was caught.

And what most people don't know is that a lot of it, billions of dollars' worth of seafood every year, is caught illegally — caught in protected areas, or from overfished populations, for example. Tracking the illegal trade is a nightmare. A fish could be caught by a Korean vessel, shipped to a Chinese packing plant and sold to a distributor in Canada before it gets to the United States.

But now there's a new way to monitor the trade, at its very start, on the high seas: By watching it from space. John Amos is one of the pioneers. He runs a small organization in West Virginia called SkyTruth. He started out collecting satellite images of oil spills in the ocean. In 2011, he learned about the automatic identification system, or AIS, which ships use to prevent collisions at sea.

"Those AIS communication broadcasts can be picked up by orbiting satellites," Amos explains. Large ships carry electronic devices that constantly broadcast the ship's location and heading. This signal includes the boat's name, and where it's from.

Working with Google, Amos developed software that uses AIS signals to track up to 150,000 vessels all over the world. And he's also collaborating with the Pew Charitable Trusts, a nonprofit that's trying to curb illegal fishing with a program called Eyes on the Seas.

Amos learned how to recognize the kind of movement displayed on a map of the ocean that

indicates a boat is fishing. "It's kind of a slow back and forth movement that would indicate they've put fishing gear, like long lines with baited hooks, into the water," he says. Now, clearly Amos can't watch all the world's oceans. Instead, he's been watching areas pinpointed by experts at Pew, such as new or proposed marine reserves, and places frequented by pirate fishing vessels.

Last month, Amos was tracking boats near Palau, an island nation in the Pacific Ocean, near Indonesia. He spotted one following that tell-tale fishing pattern. The AIS data revealed it was a Taiwanese boat. He contacted officials in Palau, who said the boat was fishing illegally. "The authorities in Palau decided to intercept it, and they sent their patrol boat out," Amos recalls. He monitored both boats from his office in West Virginia, using AIS data.

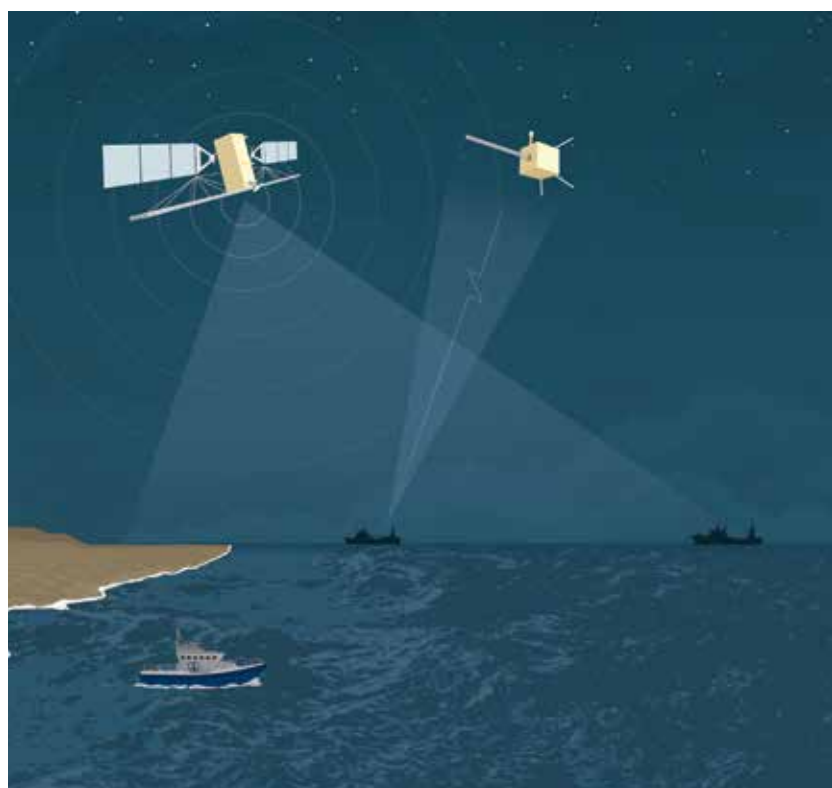
"(It was) kind of a nail-biting time," he remembers, "where we're sitting in the office past midnight, monitoring our computer screen so that we could provide updated location information to the authorities in Palau that they could relay to the patrol boat."

Authorities boarded the vessel, and according to the Palau government, it was crammed with illegally caught tuna and shark fins.

So AIS tracking works. But it's limited. It only transmits data on a ship's location and identity. And a ship captain can switch it off. So the Pew Trusts is now acquiring actual images of ships, taken from satellite cameras and radar onboard satellites.

Tony Long, who leads Pew's ending illegal fishing campaign and is a former Royal Navy electronic warfare expert, says radar and photos give you much more information. "You can see what type of vessel it is," he says, "and any activity on deck, and indeed, if there is any fishing gear in the water."

One thing he looks for is the transfer of fish from one vessel to another. That's not illegal, but it's often a way to launder illegally caught fish, to mix it with a legal



Satellite monitoring of activity on the oceans, combined with other data, helps authorities catch illegal fishing vessels and allows law-abiding fleets to prove where and when they landed their catch. *Sara Flood*

catch, for example. "You can see quite clearly two vessels side by side," he says of the images.

The satellite system has already caught at least two boats fishing illegally. But it can't catch every pirated fish. And once a fish reaches land, the route to the American dinner table gets, as Beth Lowell puts it, "Opaque, vague, foggy."

Lowell is a fisheries expert at Oceana, another environmental organization trying to curb illegal fishing. Lowell says when it comes to stories, even spinach has a clearer plot line than fish.

"If you look on the back of some bags of spinach, you can put a code in and track it back to the farm it came from," she notes.

The federal government is now drafting a plan that would encourage governments and international organizations to document every link in the whole seafood chain, something Lowell calls "traceability."

For every batch of seafood, she says, authorities would know that "it got picked up at the warehouse, it's on shipment to the next site, it's on a plane, now it's on your doorstep. And that's what we want to be able to do with seafood."

The federal government is due to publish its plan for cracking down on illegal fishing this spring. If it works, more of your fish may be coming with a tale attached.

This story appeared on NPR on Feb. 5, 2015.

Making a Difference for the World's Oceans

Sharing a commitment to save the seas, the Bertarelli Foundation and Pew are seeking creation of a large marine reserve in the South Pacific.

BY DANIEL LeDUC

Easter Island, a UNESCO World Heritage Site known around the world for the more than 800 Moai statues that dot its landscape, sits 2,500 miles off the coast of Chile. The deep waters surrounding the island, which are largely unexplored, include areas of rare biodiversity containing migratory fish species as well as seamounts that date back more than 13 million years.

Easter Island's remoteness has left its waters largely unspoiled, making it an ideal candidate for a large marine reserve. And that, in turn, has made it the perfect location for a rewarding partnership between The Pew Charitable Trusts and the Bertarelli Foundation, which are working together to support the island's indigenous people, the Rapa Nui. The islanders are undertaking a communitywide marine conservation initiative and collaborating with the Chilean government to create what would be one of the world's largest marine protected areas while preserving their cultural and traditional fishing practices.

Founded in memory of Fabio Bertarelli, the leader of the multinational biotechnology company Serono, the Bertarelli Foundation initially focused its work on life sciences. In 2008, the foundation's trustees—Fabio's widow, Maria Iris, and the couple's children, Dona and Ernesto (the co-chairs of the foundation)—added a marine program that reflected the family's growing concern about the ecological threats to the world's oceans.

"The sea has always been part of my family's life," says Dona Bertarelli, who like her brother, is an accomplished record-breaking competitive sailor. "It is essential that we preserve its health for the sake of the entire planet."

The partnership between Pew and the Bertarellis is built on a shared commitment to marine conservation in the Indian Ocean. In 2010, Pew's

Global Ocean Legacy campaign and a coalition of partners in the United Kingdom advocated for the creation of the Chagos Marine Reserve in the British Indian Ocean Territory. The Bertarelli Foundation made a critical investment that helped to secure the designation of the reserve, and the foundation has continued its involvement, providing the crucial support necessary for the patrol ship to help monitor and enforce the 247,000-square-mile (640,000-square-kilometer) reserve, which is home to 220 types of coral, 800 species of fish, and the Great Chagos Bank, the world's largest coral atoll.

The support of the Chagos patrol ship represents one end of the spectrum of what Dona Bertarelli calls the foundation's "first-step-to-final-mile approach." The foundation explores and researches solutions to slow the degradation of the ocean and the communities that depend on it, finds ways to implement those solutions, such as establishing marine reserves, and then follows through to the "final mile" by providing the resources, such as the Chagos monitoring and enforcement, necessary for long-term success.

The foundation draws on the family's approach to health research and the life sciences in addressing issues related to the seas. "We attempt to understand the whole ocean as a complete system, not unlike the human body," says Bertarelli. "And we seek interventions that provide both immediate relief as well as the potential for regeneration of the oceans."

The Bertarellis say they admire Pew's reliance on science and research, expertise on ocean issues, and ambition to take on large-scale projects. So they were interested in 2012 when the opportunity arose for collaboration on an Easter Island marine reserve.



"We're keen that not only will the Rapa Nui be able to protect their future but that we can also help them ensure that their children and grandchildren never forget why their oceans are so important," says Dona Bertarelli.

*Above: Bertarelli Foundation
Ralf Hettler/iStockphoto*



The project offered the chance to help champion the establishment of a significant protected area for the waters around Easter Island, and for the first time to test the use of satellite technology as a means to provide cost-efficient monitoring of large scale marine reserves. As such, it responded directly to the Bertarellis' goal of seeking solutions that last beyond the "final mile."

The satellite imagery suggested that illegal fishing was taking place in Easter Island's exclusive economic zone (EEZ)—helping to reinforce the case for the reserve and leading Chilean officials to praise the Bertarellis for their investment in this work. The Easter Island satellite project has also helped to inform Pew's development of a global ocean monitoring system called Eyes on the Seas. This will incorporate additional data that allow the system to detect illegal maritime activities in real time, providing governments and other authorities responsible for stewarding marine reserves with a means to monitor their waters affordably and efficiently.

Dona Bertarelli has played an active role in the Easter Island marine reserve campaign, visiting the island to meet with the native Rapa Nui who are driving the proposal, and with government officials in Chile who will make the final declaration after a government-led public consultation. Local fishing groups have proposed leaving a band around the

island and other traditional fishing grounds open to island fishermen but otherwise fully protecting the EEZ, which is about 270,000 square miles (700,000 square kilometers.) The foundation also hopes to support the development of a marine education center on Easter Island once the reserve has been designated. Bertarelli says, "We're keen that not only will the Rapa Nui be able to protect their future but that we can also help them ensure that their children and grandchildren never forget why their oceans are so important."

Pew is pleased to join forces with the Bertarelli Foundation, which brings a pragmatic, businesslike discipline to the work and has increased the effectiveness of the campaign. "The Bertarelli Foundation is a marvelous partner. Everyone is deeply engaged in the science that ocean projects demand, and they're seeking the same measurable return as Pew on their investment," says Sally O'Brien, who leads Pew's philanthropic partnerships. "It is so rewarding to see our work together having a transformative impact on the health of the world's oceans."

For more information about philanthropic partnerships at Pew, please contact Senior Vice President Sally O'Brien at 202-540-6226 or sobrien@pewtrusts.org.

Daniel LeDuc is the editor of Trust.

Seeking a Cure for Cancer

Arvin Dar is a member of the inaugural class of the Pew-Stewart Scholars Program for Cancer Research, a national initiative designed to support promising early career scientists whose research will accelerate discovery and advance progress to a cure for cancer. The program—funded by the Alexander and Margaret Stewart Trust and administered by Pew—will support five investigators each year. The Stewart Trust has invested in innovative, cutting-edge cancer research and scientists for more than 15 years. Through this partnership, the Pew-Stewart Scholars for Cancer Research has tremendous potential to solve some of cancer’s weightiest challenges.

Dar studies chemical biology and is an assistant professor in the oncological sciences department at the Icahn School of Medicine at Mount Sinai in New York. He sat down with Trust to talk about his efforts to develop novel treatments for some of the most aggressive cancers.

What led you to pursue a career in science?

First and foremost, I love being a scientist. I fell in love with being a research scientist when I was an undergraduate student at the University of Western Ontario. Going into university, I thought I might become a physician like my father, who is an oncologist, or a scientist like my mother, who majored in chemistry and biology.

It was a summer research project focusing on a process called transposition that really got me hooked on hands-on research. Transposons, or “jumping genes,” are DNA sequences that move around the genome. I worked purifying proteins and recreating parts of that reaction in test tubes, and spent that summer learning the ropes of how to set up experiments. That’s when I learned the power of science, how you could break down complex problems into digestible pieces, and I just fell in love with the process.

What are you researching now?

The goal of my research is to develop novel treatments for cancers, and my focus is on a gene

called Ras. Mutant forms of Ras are involved in more than 20 percent of cancers, including pancreatic cancer and melanoma—some of the most aggressive types.

During my postdoctoral fellowship at the University of California, San Francisco, I was studying an enzyme called kinase suppressor of Ras, or KSR, in the lab of Kevan Shokat, who is a 1996 Pew scholar. We discovered that, in one configuration, KSR keeps Ras from doing its job, but in another configuration, it actually facilitates Ras activity—stimulating other genes that lead to the increased cell division we see in cancer.

Now, my lab at Mount Sinai hopes to find small molecules that can lock KSR into its Ras-blocking conformation.

We then want to know whether any of these small molecules can stop the increased cell division triggered by the overactive forms of Ras.

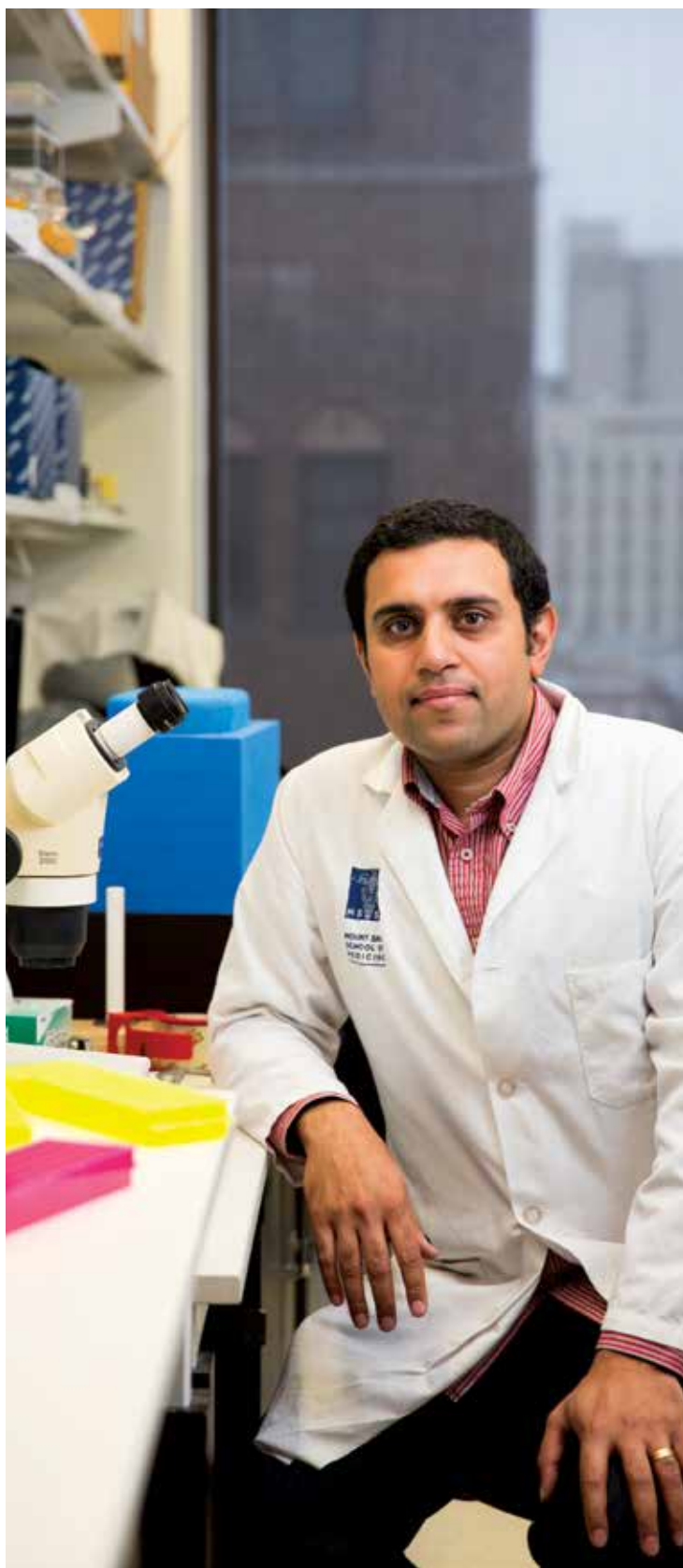
How might your findings lead to cancer cures?

There are a lot of these proteins—like KSR—that look like active enzymes, but they’re not actually active. When you’re thinking about how to make a drug that targets an enzyme—which are proteins that catalyze reactions—you’re usually trying to block the enzyme’s activity. But what we’re trying to do is actually target a protein that’s consistently inactive.

No one has ever come up with a drug to target these kinds of proteins, but we know that many of them probably are important in diseases. We’re focusing on KSR because of its role in Ras-dependent cancers, but we’re hoping that we can figure out the paradigm of how to target an inactive enzyme for therapeutic applications. That could be important for cancer, and it could be important for other diseases, as well.

Now that you are leading your own lab, what do you look for in the scientists working with you?

One of the key things I look for is enthusiasm for the area. It’s not necessarily critical to me that



Pew-Stewart Scholar for Cancer Research Arvin Dar: "It's cool to have people who will just jump into an experiment...just think about the positive, why it will work." *Katye Martens/The Pew Charitable Trusts*

someone's background matches the project they're working on. It's really more the enthusiasm to want to learn and to try something different.

I've really enjoyed having graduate students joining my lab because they come with limited or almost no training, as well as postdoctoral fellows that want to learn new areas or techniques. In both cases, there are no preconceived ideas. It's cool to have people who will just jump into an experiment and aren't thinking why something won't work; they just think about the positive, why it will work. Some amazing things come out of that, I think.

Is that the kind of thinking that can lead to novel treatments?

I hope so. The majority of drugs fail in late-stage clinical trials because there's not enough effect on the tumor relative to the toxic side effects of the drug. When the success rate of drugs is less than 5 percent, a lot of drugs succeed because of reasons that were never originally intended, and some fail because of reasons that we never understand. We want to make an impact by creating therapies that work and have minimal side effects, but we also want to understand why current approaches aren't working well.

How do you think your work will be enabled by your Pew-Stewart award?

To be part of the inaugural group of Pew-Stewart scholars is an amazing boost to me and the lab and gives us a great sense of confidence moving forward. But this is more than an award to me; it's an opportunity to be a part of a community of scientists who aren't only in different areas and talking to each other, but who support each other in developing their science in their research. I'm really looking forward to the opportunity to get to know the other scientists. I expect that learning what other people are doing at the cutting edge of their different areas will feed back into my own lab and will make our own science that much better.

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



The Micronesia Regional Shark Sanctuary is the first to stretch across international waters and is home to a variety of sharks, including blacktip reef sharks. Dave Fleetham/Design Pics/Getty Images

First multinational shark sanctuary finalized

President Emanuel Mori of the Federated States of Micronesia signed legislation in February to create the world's 10th shark sanctuary and complete establishment of the Micronesia Regional Shark Sanctuary. The first sanctuary to stretch across international borders, it includes the waters of nine island governments in the western Pacific Ocean, including Palau, the Marshall Islands, and the U.S. territories of Guam and the Commonwealth of the Northern Mariana Islands.

Commercial fishing and trade of sharks and their parts are banned within the regional sanctuary,

which is larger than the European Union. The Marshall Islands and the Federated States of Micronesia also have banned use of fishing gear typically used to target sharks, while Guam and Yap extended protections to all species of rays.

Over the past five years, Pew staff members made frequent trips to all of the regional islands and worked to develop the sanctuary. They collaborated with local partners and with Carlotta Leon Guerrero, who was a member of the Pew Oceans Commission, and Pew marine fellow Willy Kostka, executive director of the Micronesia Conservation Trust. The Pew team ran enforcement workshops for local officials, filmed public service announcements, and

U.S. protects forage fish in Washington, Oregon, and California

Fishery managers on the West Coast took action in March to protect numerous species of forage fish. With global demand booming for the small fish, which are used commercially in fish meal and fish oil, the Pacific Fishery Management Council unanimously decided to preemptively establish conservation

measures for species that aren't yet being targeted.

Pew worked over the past four years to provide scientific and technical guidance to the council and to build awareness and support for protecting forage fish such as sand lance and saury. Many of these species are obscure, but they perform a crucial ecological role in the food web: They consume plankton and in turn are consumed by seabirds, marine mammals, and bigger fish such as salmon and tuna.

hosted screenings of the film "Sanctuary: Last Stand for Sharks."

In Micronesia, the Micronesia Conservation Trust and Pew led a group that engaged with stakeholders and lawmakers to develop a law that was culturally sensitive and science-based. The group included local nongovernmental organizations; the government research and development committee, foreign affairs committee, and fisheries agency; representatives from longline and purse seine fishing companies; and the attorney general.

Pew experts in Micronesia have helped to establish shark sanctuaries in Palau (2009), the Northern Mariana Islands (2011), Guam (2011), the Marshall Islands (2011), Kosrae (2012), Pohnpei (2013), Yap (2013), Chuuk (2014), and Micronesia (2015). Six airports in three countries stretching from Koror, Palau, in the west to Majuro, Marshall Islands, in the east display Pew-sponsored signs that proclaim their islands as havens for sharks.

New justice reforms in three states

Pew helped South Dakota, Utah, and West Virginia improve adult and juvenile sentencing and corrections policies to bolster public safety and save tax dollars:

- South Dakota's juvenile justice reforms, enacted March 13, could reduce the number of youth in residential placements by 50 percent and save the state \$32 million within five years.
- Utah's sentencing and corrections reforms, approved March 31, will avert nearly all of the state's anticipated prison growth for more than a decade, saving approximately \$500 million.
- West Virginia's juvenile justice reforms, approved April 2, are expected to reduce the number of youth in residential placements by at least 16 percent and save the state more than \$20 million over five years.

USDA proposes new standards for poultry

The U.S. Department of Agriculture's Food Safety and Inspection Service, known as FSIS, proposed new federal standards Jan. 21 to reduce *Salmonella* and *Campylobacter* contamination in ground chicken and turkey products and in raw chicken breasts, legs, and wings. The announcement follows a December 2013 report by Pew's safe food project, *Weaknesses in FSIS's Salmonella Regulation*. The report examined how two outbreaks of foodborne *Salmonella* infections linked to a specific chicken producer exemplified flaws in the federal food safety program, and it made seven recommendations to improve FSIS's control of *Salmonella* in poultry and strengthen the agency's response to outbreaks caused by these bacteria.

Interior Department proposes offshore drilling regulations for the Arctic

The Interior Department on Feb. 20 proposed the first Arctic-specific rules for offshore oil and gas development to improve safety and prevent spills in U.S. Arctic waters. The proposed rules incorporate lessons learned from previous incidents, address ways to stop an oil-rig blowout, and provide communities some assurance

that companies are prepared to respond. The rules incorporate standards advocated by Pew, including creation of operator emergency plans tailored for Arctic conditions and drilling schedules ensuring that operators can conduct emergency operations before seasonal ice interferes. Current offshore drilling standards were largely written for temperate waters.

Progress on antibiotic development, antibiotic discovery, and reducing antibiotic use

- Senators Orrin Hatch (R-UT) and Michael Bennet (D-CO) on Jan. 16 introduced the Promise for Antibiotics and Therapeutics for Health Act, which proposes a new regulatory approval process for certain antibiotics that are used to treat patients who have serious or life-threatening bacterial infections and have few suitable treatment options. Pew's antibiotic resistance project provided technical assistance on the bill, which is companion legislation to a House bill introduced in 2013, for which Pew provided similar support and assistance.
 - The antibiotic resistance project hosted a meeting of experts from academia and industry Jan. 15-16 to identify ways to reduce impediments to the discovery of new antibiotics. The session was part of a larger effort to increase collaboration across academia and industry and to encourage discovery of new drugs and therapies to treat bacterial infections.
 - The project and the U.S. Centers for Disease Control and Prevention convened a group of experts March 3-4 to begin establishing a national goal for reduction in antibiotic use. Discussion focused on current rates of prescribing and on setting ambitious but realistic goals for reducing antibiotic use in outpatient settings.
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Illinois and New Mexico join the Electronic Registration Information Center

In their just-concluded legislative sessions, lawmakers in Illinois and New Mexico voted to join the Electronic Registration Information Center, which Pew created in 2012 to help states share information so that voter rolls stay accurate in an increasingly mobile society. Currently participating in ERIC are 11 states and the District of Columbia,

which have registered hundreds of thousands of new voters and identified nearly 2 million out-of-date voter records.

States improve long-term fiscal health

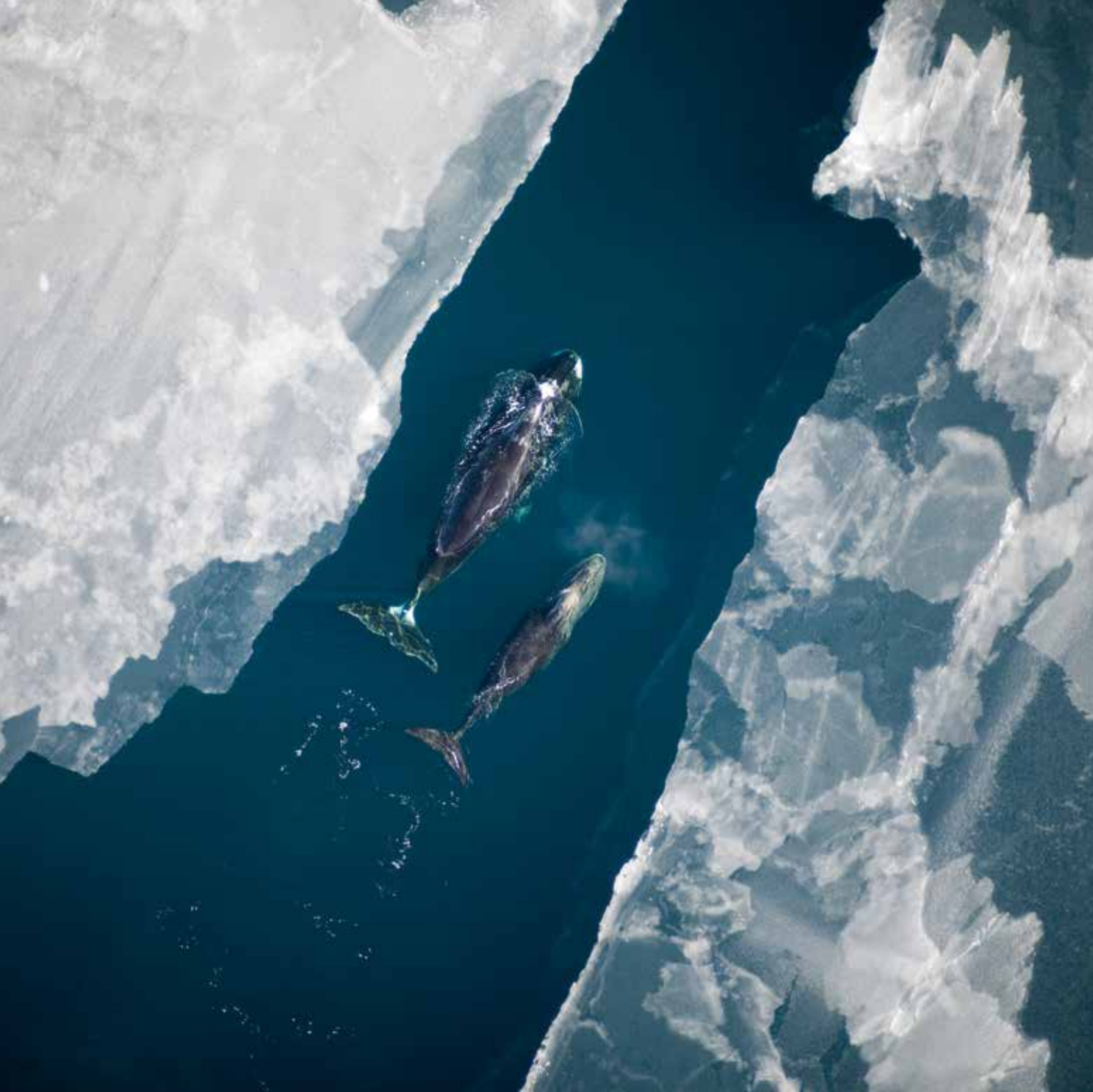
Pew provided extensive technical assistance to Utah and Nebraska on ways to reduce revenue volatility and better manage state budgets. Utah, which approved reforms in March, will increase the amount of money the state puts into its rainy day funds, improving its ability to save, manage volatility in revenue collections, and prepare for the next economic downturn. In Nebraska, whose unicameral Legislature took action in April, the fiscal office will conduct a revenue volatility study before each biennial budget cycle to help inform policies for its rainy day fund.

Major step for ocean conservation at UN

Large protected reserves are needed to safeguard marine life on the high seas outside national waters. But there is no international framework on how to create them. On Jan. 24, a United Nations working group began to remedy that, by recommending the development of a new international agreement on marine reserves. Pew has been working closely with governments around the world, holding workshops and convening high-level meetings, to build support for launching negotiations on the treaty.

Pew priorities featured in federal report on consumer financial products

On March 10, the Consumer Financial Protection Bureau (CFPB) released a study detailing the prevalence of mandatory binding arbitration clauses in checking account, prepaid card, credit card, and private student loan agreements. Under these clauses, consumers must submit to arbitration to settle disputes with banks, but 3 out of 4 consumers were unaware of this requirement. The study cites Pew research 14 times, relying on the consumer banking project's 2012 report, "Banking on Arbitration: Big Banks, Consumers, and Checking Account Dispute Resolution." The CFPB findings will help the agency determine whether to propose new regulations for arbitration clauses.



The habitat of walrus as well as bowhead whales such as these will be protected.

Amelia Brower/Alaska Fisheries Science Center

Lasting protections for the U.S. Arctic Ocean

President Barack Obama on Jan. 27 acted to permanently protect five ecologically valuable areas in the Arctic Ocean from future oil and gas development. These areas total 9.8 million acres, about twice the size of Massachusetts. They include a 25-mile-wide corridor in the Chukchi Sea, a shallow shelf known as Hanna Shoal, part of Barrow Canyon, and two sections of waters offshore of the Alaskan communities of Barrow and Kaktovik. Long recognized as biologically rich habitats for bowhead whales and walrus, the waters are also important to the subsistence cultures of the Inupiat people in coastal communities.



Performers in traditional Japanese garb get ready for the National Cherry Blossom Festival and Parade in Washington. A vast majority of Americans seek closer ties between the U.S. and Japan. *Getty Images*

70 years after World War II, mutual respect between Americans and Japanese

Despite the United States and Japan being adversaries in World War II and fierce economic competitors in the 1980s and early 1990s, 68 percent of Americans trust Japan a great deal or a fair amount, and 75 percent of Japanese say they feel the same about the United States, according to a new survey released in April by the Pew Research Center in association with the Sasakawa Peace Foundation USA. Overall, 83 percent of Americans want ties between the two nations to remain close or get closer. They are divided over whether Japan should play a more active military role in the Asia-Pacific region, though twice as many Americans as Japanese (47 percent to 23 percent) think Japan should take on more military responsibilities. Bruce Stokes, the research center's director of global economic attitudes, briefed the Japanese ambassador to the United States and a special adviser to the Tokyo city government about the findings and presented the data at events hosted by the Sasakawa Peace Foundation USA and the Council on Foreign Relations.



Pew Research Center briefs Senate committee about unauthorized immigrants

Jeffrey S. Passel, a senior demographer at the Pew Research Center, testified March 26 before the U.S. Senate Committee on Homeland Security and Governmental Affairs about the center's estimates of the number of unauthorized immigrants in the United States. Speaking at a hearing called "Securing the Border: Defining the Current Population Living in the Shadows and Addressing Future Flows," Passel presented labor force data from the center. The data showed that the U.S. unauthorized immigrant workforce now holds fewer blue-collar jobs and more white-collar positions than it did before the Great Recession but that a solid majority still works in low-skilled service, construction, and production occupations.

Party identification marked by deep demographic divides

The Pew Research Center conducted a detailed analysis last year of long-term trends in party affiliation among the American public, based on more than 25,000 interviews. The study, the results of which were released in April, provides a rare look at where the parties stand among even relatively small subgroups of the public. Overall,

32 percent of Americans identify as Democrats, 23 percent identify as Republicans, and 39 percent identify as independents—the highest percentage of independents in more than 75 years of polling. Democrats hold advantages in party identification among African-Americans, Asians, Hispanics, well-educated adults, and millennials. Republicans lead among whites—particularly those with less education, men, and evangelical Protestants—as well as members of the silent generation (born between 1925 and 1945).

Many teenagers online 'almost constantly,' thanks to smartphones

Nearly three-quarters of U.S. kids ages 13 to 17 now use smartphones, and 92 percent say they go online daily—including 24 percent who report being online "almost constantly"—according to a Pew Research Center report released in April. Facebook is the most popular and frequently used social media platform among teens, with 71 percent using the site; half of teens use Instagram, and 4 in 10 use Snapchat. Teenage girls use social media sites for sharing more than do their male counterparts, who are more likely to own gaming consoles and play multiplayer video games.

INVIGORATING CIVIC LIFE

Grants to support Philadelphia region's frail elderly

Pew will award \$4.3 million over three years to support 27 Philadelphia area organizations that work to preserve the dignity and quality of life of low-income, frail elderly individuals in the region. The organizations deliver services that help seniors obtain public benefits and community resources vital to their health and financial stability; reduce depression and social isolation; and provide in-home assistance. The grants will also support programs for informal caregivers, who often juggle responsibilities for elderly loved ones while managing their own health and financial well-being.

Education top issue in the City of Brotherly Love

Philadelphians view K-12 education as the top issue facing their city—over public safety or jobs and the economy—according to a March poll commissioned by Pew's Philadelphia research initiative. The survey also showed that city residents have extremely low opinions of the public school system's performance and have mixed views on the value of charter schools: Although a majority saw charters in a positive light, a similar majority also backed the idea of improving education by spending more money on traditional public schools rather than creating additional charters and other options.



The museum is reaching new audiences with its Art After 5 programs, which include music and dance performances such as this one in the museum's Great Stair Hall. Elizabeth Leitzell via The Pew Center for Arts & Heritage

Bringing contemporary African works to the Philadelphia Museum of Art

In April, the Pew Center for Arts & Heritage awarded \$500,000 to the Philadelphia Museum of Art to support an extensive project centered on historic and contemporary African art that will expand the museum's programs, engage new audiences, and establish a partnership with the University of Pennsylvania Museum of Archaeology and Anthropology. Scheduled to begin in the spring of 2016, the project will promote greater understanding and appreciation of African culture as a dynamic and complex relationship between past and present, and between tradition and innovation. The center's funding will specifically support commissions and residencies for contemporary African artists and the presentation of their work. This is the center's fourth advancement grant, designed to support multiyear transformational projects by arts and cultural organizations in the Philadelphia area.

Barriers to Shared Data in States

But new approaches can help overcome them and assist policymakers.

BY SUSAN K. URAHN

State governments increasingly understand the importance of developing policy based on reliable evidence. They also recognize that much of the data needed to improve policy development, programmatic effectiveness, operational efficiency, and transparency are already on state computer servers. And while harnessing this information will be a challenge for state leaders over the coming decade, the potential to reduce costs and improve outcomes for citizens is enormous.

Unfortunately, unnecessary obstacles—including rules that restrict agencies from sharing data with each other—can prevent states from using data to resolve some of their major policy challenges. And states have found it difficult sharing economic development data effectively with local governments. But there are steps that states can take to overcome barriers to sharing and linking data sets and to use data they already own rather than asking residents and businesses to provide the same information multiple times.

Economic-development incentive policies offer a prime example of the benefits of data-sharing. These programs can be difficult to administer and evaluate because multiple agencies are sometimes responsible for the same project without being permitted to share data with one another, leading them to overlook key evidence or collect duplicative information.

In states that share data across agencies, the increased access to information has helped policymakers make informed decisions about where to invest taxpayer dollars. For example, businesses that receive tax incentives by participating in Oklahoma's flagship program, Quality Jobs, don't receive their quarterly checks until state agencies—using shared data from tax returns and employment records—verify that their job creation and salary commitments have been met.

There is potential for additional progress because technological advances make data collection, management, access, and protection easier. Michigan

has implemented a cloud-based system that allows state and local officials to input and access information in real time, enabling greater coordination when recruiting new businesses.

But while technological advances are making data-sharing and analytics easier, they don't overcome legal barriers or differences in agency mission. That's where a collaborative interagency approach is needed.

Pew, along with the Center for Regional Economic Competitiveness, is working with interagency teams in Indiana, Maryland, Michigan, Oklahoma, Tennessee, and Virginia to identify opportunities to improve economic development policy, including through sharing data. Because issues are frequently similar from state to state, the six states have been able to share innovations.

In some states, bringing together key players from economic development and tax agencies has led to increased information-sharing and more informed decision-making. Other states have identified a need for legislation or memorandums of understanding that will permit data-sharing while protecting the integrity and confidentiality of the information.

After hearing about Oklahoma's success in sharing data across agencies, officials at Michigan's tax and economic development agencies began experimenting with ways to collaborate more closely and made significant progress in exchanging information. Michigan's economic development agency now has a better understanding of what it is getting for its money, and the tax agency is better able to plan for the fiscal impact of incentives.

Removing barriers that keep data sets in their own silos is not easy. But we're beginning to see exciting opportunities for policymakers to fully leverage existing data to make smarter decisions about allocating resources and delivering key services to taxpayers.

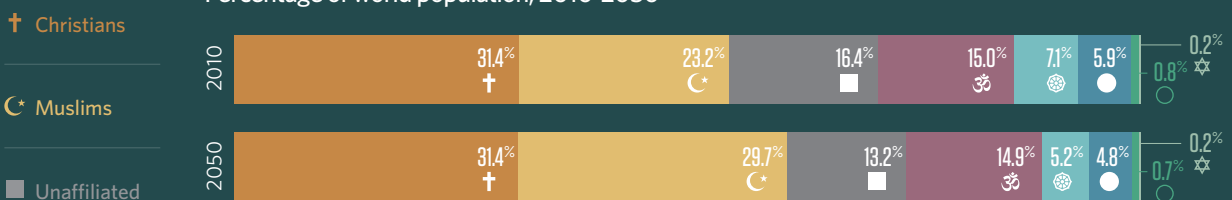
Susan K. Urahn is executive vice president of The Pew Charitable Trusts. A version of this column originally appeared in Governing.

The Future of the World's Religions

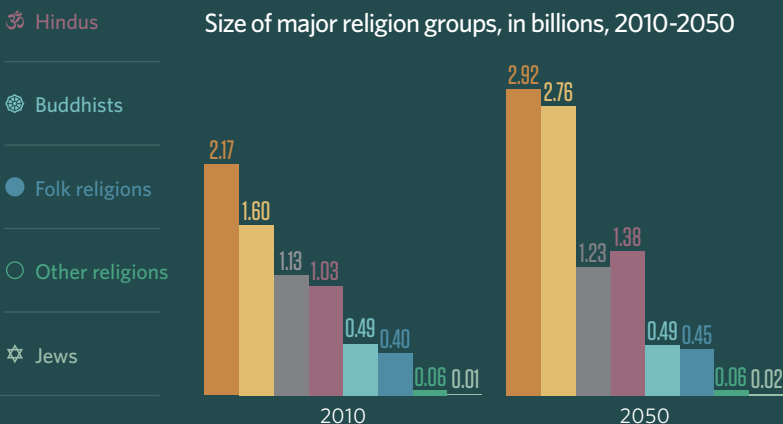
Over the next four decades, Islam will grow faster than any other major religion, according to the Pew Research Center. If current demographic trends continue, by 2050 the number of Muslims around the world will nearly equal the number of Christians, possibly for the first time in history.



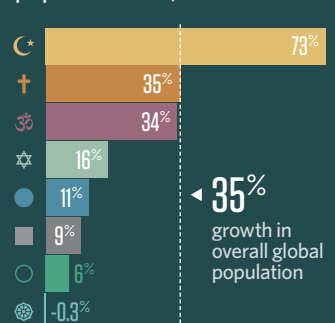
Percentage of world population, 2010-2050



Size of major religion groups, in billions, 2010-2050



Estimated change in population size, 2010-2050



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Getting up close to some of the smallest—and most important—fish in the sea.

Just Below the Surface, Page 30

