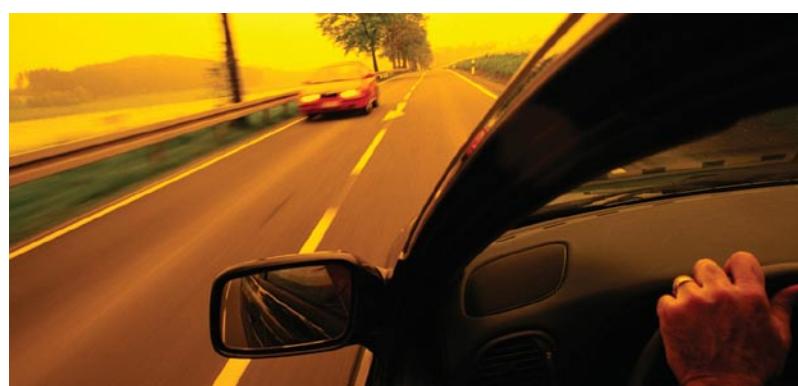
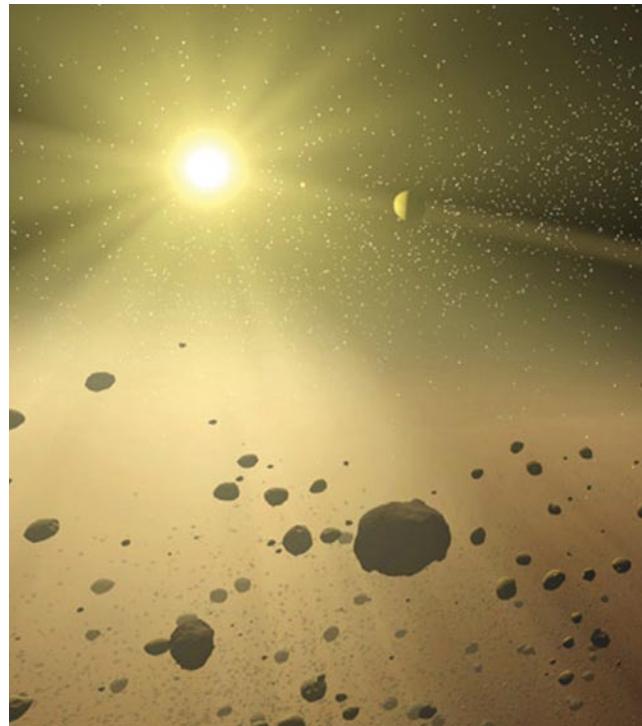


THE NATIONAL ACADEMIES **INFOCUS**

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A Climate Change Call to Action

Spotting — and Stopping — Dangerous Space Objects

More to Come on Genetically Engineered Crops

Ways to Reduce Vehicle Fuel Consumption

Summer 2010

vol. 10 number 2

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

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Page 2: Removal of Albert Herter's mural, *Prometheus Bound*, from the north wall of the Great Hall at the NAS building, photo courtesy Cultural Programs of the National Academy of Sciences

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Page 15: Air Force squadron returns home after deployment in support of Operation Iraqi Freedom, photo courtesy U.S. Department of Defense

Pages 16&17: Restoration of the historic home of the National Academy of Sciences began this summer, photos courtesy Cultural Programs of the National Academy of Sciences and Tamara Luzeckyj, senior conservator at Olin Conservation Inc.

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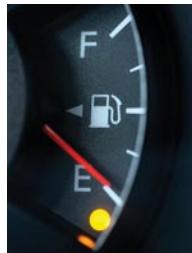


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Answering the Call

Top kill. Blowout preventer. Chemical dispersants. Who could have imagined how these unfamiliar terms would dominate the news and everyday conversations in the summer of 2010? But beginning with the tragic explosion that took 11 lives on BP's Deepwater Horizon drilling platform in April, followed by the millions of barrels of oil that spewed into the Gulf of Mexico in the months since, we now share a national crisis of confidence about an industry we all rely upon for our energy-intensive economy and lifestyle.



Deepwater Horizon has raised questions about drilling for oil a mile or more deep in the ocean, the capabilities and independence of government regulators to ensure the safety of deep water operations, and the price we are willing to pay in losses to local economies and regional ecosystems when something goes terribly wrong.

The Academies and National Research Council have always stood ready to examine complex problems on the federal government's behalf, problems that lie at the intersection of science, engineering, medicine, and policy. In this crisis, the call came to us within two weeks, asking the National Academy of Engineering and Research Council to conduct an independent technical analysis of the causes of the Deepwater Horizon disaster, with the goal of preventing similar accidents in the future. An expert committee, led by NAE member and former Navy Secretary Donald C. Winter, is already gathering evidence to address this task. Our study will also help inform investigations by the Coast Guard, the Bureau of Ocean Energy Management, Regulation, and Enforcement, and a presidentially appointed commission.

In June, the Institute of Medicine was asked to focus its expertise on the spill's possible impacts on the health of workers, local residents, and clean-up volunteers. At a public workshop in New Orleans, IOM worked on the design of a system for monitoring the oil spill's short- and long-term health effects, with special attention to surveillance of high-risk and medically underserved populations.

As I write this letter, the Deepwater Horizon well appears to have finally been capped. But what next? What do we know about the toxic effects of the chemical stew Gulf residents have been exposed to for months? How will we begin to address losses to wetlands, wildlife, and fisheries? What about repairing damage to the Gulf economy, still suffering just a few years after Hurricane Katrina? And how do we prevent another disaster like Deepwater Horizon? These are all complex questions that will require the best data and careful consideration by independent experts. We are ready to offer our help and experience in addressing the legacy of the Deepwater Horizon.

The signature of Charles M. Vest, written in cursive black ink.

CHARLES M. VEST
President, National Academy of Engineering



An End to Business As Usual

NEW SUITE OF REPORTS URGES ACTION ON CLIMATE CHANGE

For decades, the National Research Council has examined the effects of global warming. In its most comprehensive study of climate change to date, the Research Council recently declared that a strong, credible body of scientific evidence shows climate change is occurring, and the nation needs to take action.

Part of a congressionally requested group of studies known as America's Climate Choices, four new reports underscore why the United States should act now to reduce greenhouse gas emissions, develop a national strategy to adapt to inevitable impacts of climate change, and coordinate reliable information systems to guide decision making.

One of the reports, *Advancing the Science of Climate Change*, says climate change is caused largely by human activities and poses significant risks for — and in many cases is already affecting — a broad range of human and natural systems. It calls for a new, interdisciplinary era of climate change science where an emphasis is placed on “fundamental, use-inspired” research that improves understanding of the causes and consequences of climate change and the actions that can be taken to respond to climate change. To coordinate such an effort, a single federal entity or

program should be given the authority and resources; the existing U.S. Global Change Research Program could fulfill this role.

Another report, *Limiting the Magnitude of Future Climate Change*, focuses on strategies to reduce concentrations of greenhouse gases in the atmosphere. It recommends that the United States establish a greenhouse gas emissions “budget” that sets a limit on total domestic emissions over a fixed period of time. A comprehensive carbon-pricing system with a collection of targeted complementary policies, such as regulations and incentives, is the most cost-effective way to reduce these emissions. The report warns, however, that the longer the nation waits to begin reducing emissions, the harder and more expensive it will likely be to reach any given emissions target.

Although the report does not recommend a specific domestic emissions budget, it examines an illustrative range of 170 billion to 200 billion tons of carbon dioxide equivalent for the period 2012 through 2050. Even at the higher end of this range, meeting the target will require a major departure from business as usual in how we produce and use energy.

While efforts can be taken to limit future impacts, some — such as rising sea levels, disappearing sea ice, and increasingly extreme weather events — are already being observed, and others in the future may be unavoidable, says a third report, *Adapting to the Impacts of Climate Change*.

Adaptation to climate change calls for a new paradigm — one that considers a range of possible future climate conditions and associated impacts, some outside the realm of past experience. Boosting U.S.

adaptive capacity now can be viewed as “an insurance policy against an uncertain future,” while inaction could increase the risks. Although much of the response to climate change will occur at local and regional levels, a national adaptation strategy is still needed to facilitate cooperation and collaboration across all lines of government and among the private sector and various organizations.

To help guide decision makers on how they should limit and adapt to climate change, the federal government needs to establish reliable and timely information



and reporting systems, such as climate services and a greenhouse gas accounting system, says the report *Informing an Effective Response to Climate Change*. It also recommends mechanisms for improving communication and education about climate science and response options and calls for a systematic framework for making and evaluating decisions about how to effectively manage the risks posed by climate change.

An overarching report will be released later this year that will build upon all four reports and other materials. For more information, visit <www.americasclimatechoices.org>.

— Jennifer Walsh & Molly Galvin



GE Crops Set the Stage for Growth, But Uncertainties Remain

Since their introduction in 1996, genetically engineered (GE) crops designed to resist various weed killers and insects have transformed farming, so much so that today more than 80 percent of soybeans, corn, and cotton grown in the United States is genetically engineered. But a recent National Research Council report cautions that overuse could diminish certain GE crops' effectiveness and the technology's wider application.

Many U.S. farmers who use GE crops have seen lower production costs, higher yields, and higher profits, the report says. Moreover, positive environmental impacts are being felt on and off the farm. In many cases fewer and less-toxic herbicides and insecticides are applied, and farmers till less to control the weeds. Such practices have improved the quality of soil and waterways, as well as reduced erosion.

However, some of these benefits will decrease unless farmers employ other weed and insect management practices. The increased reliance on the weed killer glyphosate is reducing its effectiveness. Ten species of weeds have already grown resistant to glyphosate in areas where repeated applications are the only weed management tactic. The committee that wrote the report advised farmers to rotate crops and apply other herbicide mixes, and not to rely exclusively on glyphosate. It also recommended research on the potential evolution of weed and insect resistance to GE crops.

"Although this first wave of GE crops has shown benefits for farmers and the environment, we need to examine the long-term prospects of the technology fostering

more sustainable agriculture systems," said David Ervin, chair of the study committee and professor of environmental management and economics at Portland State University. "The advantages of GE crops may decline over time, while other pluses and risks may emerge as the technology is applied more broadly. To fully understand how GE crops will affect U.S. agriculture and the environment now and in the future, we need more research."

For instance, more needs to be known about the economic and social effects of GE crops on farmers who grow organic and non-GE conventional crops. Organic farmers can profit from a price premium available for crops free of GE traits, but their crops' value could be jeopardized if genes from GE crops flow to non-GE varieties through cross-pollination or seed mingling.

"GE technology has the potential to help solve many societal issues, such as adaptation to climate change and food insecurity, so the prudent step is to keep the technology moving forward. Strong support from both the private and public sectors will be essential," Ervin said.

— Jennifer Walsh & Molly Galvin

The Impact of Genetically Engineered Crops on Farm Sustainability in the United States. Committee on the Impact of Biotechnology on Farm-Level Economics and Sustainability, Board on Agriculture and Natural Resources, Division on Earth and Life Studies (2010, 270 pp.; ISBN 0-309-14708-5; available from the National Academies Press, tel. 1-800-624-6242; \$49.00 plus \$5.00 shipping for single copies; also on the Internet at <www.nap.edu/catalog/12804.html>).

The committee was chaired by **David Ervin**, professor of environmental management and economics, Portland State University, Portland, Ore. The study was funded by the National Research Council.

Time to Lift the PEDAL FROM THE METAL



Two Reports Review Ways to Significantly Reduce Vehicle Fuel Consumption

In a move intended to reduce petroleum dependence and cut emissions of greenhouse gases, President Obama recently issued an executive order for tougher fuel efficiency standards for the nation's vehicles. Passenger vehicles will be required to meet a combined city and highway fuel economy average of 35.5 miles per gallon by 2016, and the standards may be tightened even more in the years beyond. Also, for the first time, standards are being developed to reduce fuel consumption and emissions from medium- and heavy-duty trucks.

Now vehicle manufacturers must begin working to meet these standards. Two recent reports by the National Research Council examine ways to improve fuel economy in cars and trucks.

The first of these reports, *Assessment of Fuel Economy Technologies in Light-Duty Vehicles*, reviewed technologies for vehicles powered by three different types of engines: conventional spark-ignition, diesel, and hybrid. Using a 2007 base vehicle, the committee that wrote the report estimated the potential fuel savings and costs to consumers of various combinations of commercially available technologies. It found that several could greatly reduce fuel consumption in passenger cars, sport utility vehicles, minivans, and other light-duty vehicles without compromising vehicle performance or safety.

But implementing these technologies will also raise vehicle purchase prices — up to several thousand dollars per vehicle. The least expensive option would be to improve light-duty vehicles using conventional spark-ignition engines. If a full suite of technologies were incorporated, fuel consumption could be reduced almost 30 percent compared with a 2007 base medium-sized car.

and pick-up truck at an additional cost of \$2,200 to the consumer, the committee estimated. Even more fuel savings would result by replacing the same conventional 2007 engine with either diesel or hybrid engines and components — as much as 37 percent to 43 percent, respectively. But vehicle purchase costs would also go up by approximately \$6,000 for these options.

Both of the reports focus on fuel consumption — the amount of fuel consumed in a given driving distance — because energy savings are directly related to the amount of fuel used. In contrast, fuel economy measures how far a vehicle will travel on a gallon of fuel.

Because data on fuel consumption indicate money saved on fuel purchases and reductions in carbon dioxide emissions, vehicle stickers should provide consumers with fuel consumption data in addition to fuel economy information, the report says. Also, fuel economy test procedures should be revised to better reflect vehicle operating conditions and provide incentives to manufacturers to reduce fuel consumption.

The second report, *Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles*, estimates the improvements that various technologies and other approaches could achieve over the next decade in seven vehicle types. For example, using advanced diesel engines in tractor-trailers could lower their fuel consumption by up to 20 percent by 2020, and improved aerodynamics could yield an 11 percent reduction. Hybrid powertrains could lower the fuel consumption of vehicles that stop frequently, such



as garbage trucks and transit buses, by as much 35 percent in the same time frame.

While the cost of making these improvements would be passed on to vehicle purchasers, the report notes that many of these suites of technologies would pay for themselves even at today's energy prices, under the committee's assumptions.

The report also provides advice on how fuel economy standards should be set. Regulators should use a measure that accounts for the amount of freight or number of passengers carried by these vehicles. The miles-per-gallon measure used to regulate the fuel economy of passenger cars is not appropriate for medium- and heavy-duty vehicles, which are designed above all to carry loads efficiently. Instead, regulation of these vehicles should use a metric that shows the efficiency with which a vehicle moves goods or passengers, such as gallons per ton-mile, a unit that reflects the amount of fuel a vehicle would use to carry a ton of goods one mile.

— *Molly Galvin & Sara Frueh*

■ Assessment of Fuel Economy Technologies for Light-Duty Vehicles. Committee on the Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences (2010, approx. 260 pp.; ISBN 0-309-15607-6). The committee was chaired by **Trevor O. Jones**, chair and CEO of ElectroSonics Medical Inc., Cleveland.

■ Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles. Committee to Assess Fuel Economy Technologies for Medium- and Heavy-Duty Vehicles; Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences; and Transportation Research Board (2010, 250 pp.; ISBN 0-309-14982-7). The committee was chaired by **Andrew Brown Jr.**, executive director and chief technologist at Delphi Corp., Troy, Mich.

Both studies were funded by the National Highway Traffic Safety Administration and are available from the National Academies Press, tel. 1-800-624-6242; also on the Internet at <www.nap.edu>.

Eye on the Sky

Earth is regularly bombarded by objects from space — most of them small meteorites and dust that burn up harmlessly before striking the planet's surface. But once in a great while a larger intruder appears. In 1908, an object exploded in the atmosphere above Siberia, severely damaging a forest of over 2,000 square kilometers. And the dinosaurs may well owe their demise to an asteroid that struck the Yucatan peninsula 65 million years ago, leaving behind a crater more than 180 kilometers in diameter.

How can we know if another object of such dangerous potential is on the way, and is there anything we can do about it? These and other questions about near-Earth objects (NEOs) were explored in a recent report from the National Research Council, which recommended that government and scientists do more to identify cosmic objects that could be dangerous.

NASA is close to achieving its congressionally mandated target for spotting the largest objects — those at least one kilometer in diameter, which could cause destruction on a global scale, the report notes. But the agency cannot complete its second assignment — by 2020 to discover 90 percent of objects that are at least 140 meters in diameter — because it lacks the funds to do so. NASA could meet this goal soon after the original deadline if provided funds to field either a mission using a space-based telescope or a slower-but-cheaper survey using a ground-based telescope.

Policymakers and scientists also should set their sights on smaller objects, the report says. Recent research suggests that NEOs as small as 30 to 50 meters in diameter can be destructive. The size of

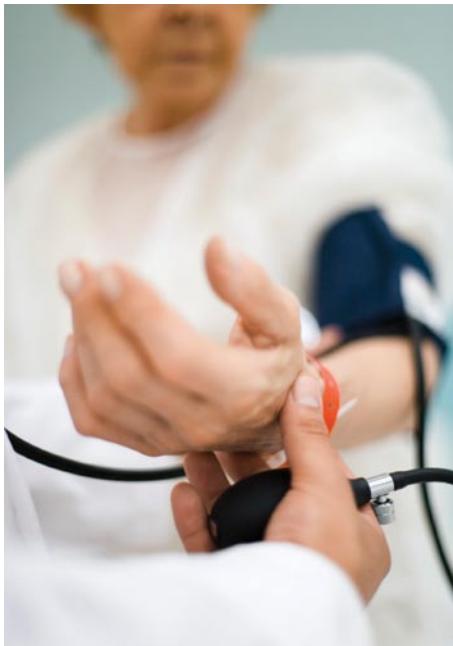


the Siberian meteor was probably in that category, and if such an object fell over New York City, hundreds of thousands of deaths might result.

The report also explores ways to defend against an NEO if we find one on a collision course with Earth. These range from civil defense — which includes evacuations and seeking shelter from an impact — to trying to send the object off course with a nuclear explosion. Other options for altering the NEO's path include flying a spacecraft directly into the object, or pushing or pulling it using gravity. While these methods are conceptually valid, they are also relatively new and immature, the report says. It recommends that the U.S. create a new research program to better assess the NEO impact hazard and ways to lessen it. And the nation should take the lead in organizing an international entity to develop a detailed plan for dealing with the threat. — *Sara Frueh*

■ Defending Planet Earth: Near-Earth Object Surveys and Hazard Mitigation Strategies. Committee to Review Near-Earth Object Surveys and Hazard Mitigation Strategies, Space Studies Board and Aeronautics and Space Engineering Board, Division on Engineering and Physical Sciences (2010, 152 pp.; ISBN 0-309-14968-1; available from the National Academies Press, tel. 1-800-624-6242; \$36.50 plus \$5.00 shipping for single copies; also on the Internet at <www.nap.edu/catalog/12842.html>).

The committee was chaired by **Irwin I. Shapiro**, former director, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass. The study was funded by NASA.



Under Pressure

GETTING A HANDLE ON HYPERTENSION

If you don't have high blood pressure, you probably know someone who does.

Chronic hypertension is so common among Americans — in part because of the high salt content of our diets — that it is becoming an almost expected aspect of getting older. Many people bear the condition for years without significant ill effects, but hypertension can trigger heart attacks, kidney failure, and debilitating strokes.

Many individuals know that their blood pressure level matters, and most have heard that too much salt is unhealthy. Doctors counsel their patients to maintain a healthy blood pressure and watch their sodium intakes, among other strategies for good health. Why then hasn't this awareness translated into healthier eating habits and lower rates of hypertension? Two new reports from the Institute of Medicine recommend strategies to tackle these stubborn problems.

People need help to take steps to avoid hypertension and keep it under control, said the committee that wrote *A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension*. American society too often makes unhealthy options the easy choices. Increased physical activity, lowered sodium consumption, and policies that create environments which support healthier eating offer greater promise of addressing hypertension than merely educating individuals

about the dangers of high blood pressure, the committee said.

The hypertension rate might be reduced by as much as 22 percent if Americans consumed less salt and ate more vegetables, fruit, and lean protein, the committee estimated. An exercise program that gets physically inactive people moving could decrease prevalence by 4 percent to 6 percent.

Physicians' lax adherence to guidelines for treating hypertension is another significant reason why many patients are unaware of their condition and don't have it under control. Medical and public health groups should undertake studies to determine why many doctors fail to follow the recommended protocol.

Excess salt is widely recognized as one of hypertension's major causes. A recent study calculated that reducing Americans' average daily sodium consumption to the currently advised maximum of 2,300 milligrams could bring down the number of individuals with high blood pressure by about 11.1 million.

But because salt is so widespread in the foods that make up the typical American diet, public education campaigns have failed to make a dent in Americans' excessive consumption of this ingredient. Likewise, the food industry's voluntary efforts to reduce sodium have fallen short because companies fear losing customers to competitors who make products with higher salt content, and with so many salty options available, people's taste preferences cannot easily change.

Given these realities, new federal standards for the amount of salt that food manufacturers, restaurants, and food service companies can add to their products are required to bring people's sodium intakes

down to safe levels, says *Strategies to Reduce Sodium Intake in the United States*. The Food and Drug Administration should gradually step down the maximum amount of salt that can be added to foods and meals through a series of incremental reductions, concluded the authoring committee.

The goal is to bring the amount of sodium in Americans' diets below levels associated with the risk of illness in a gradual way that assures food will still taste good. Because the majority of people's sodium intake comes from salt that companies put into prepared meals and processed foods — not from what individuals add with the salt shaker — this regulatory strategy would make it easier for consumers who want to avoid excess salt to succeed.

Making it simpler for Americans to make healthy choices is easier said than done. But experience shows it is necessary to help the nation finally reverse its upward hypertension rate. — *Christine Stencel*

■ **A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension.** Committee on Public Health Priorities to Reduce and Control Hypertension in the U.S. Population, Board on Population Health and Public Health Practice, Institute of Medicine (2010, 236 pp.; ISBN 0-309-14809-X). The committee was chaired by **David Fleming**, director and health officer, Public Health — Seattle/King County, Seattle. The study was funded by the U.S. Centers for Disease Control and Prevention.

■ **Strategies to Reduce Sodium Intake in the United States.** Committee on Strategies to Reduce Sodium Intake, Food and Nutrition Board, Institute of Medicine (2010, approx. 480 pp.; ISBN 0-309-14805-7). The committee was chaired by **Jane E. Henney**, professor of medicine, University of Cincinnati College of Medicine, Cincinnati. The study was funded by the U.S. Centers for Disease Control and Prevention; U.S. Food and Drug Administration; National Heart, Lung, and Blood Institute; and the U.S. Department of Health and Human Services' Office of Disease Prevention and Health Promotion.

Both reports are available from the National Academies Press, tel. 1-800-624-6242; also on the Internet at <www.nap.edu>.

Breaking the Silence on

Viral hepatitis has been dubbed a “silent epidemic.” As many as two-thirds of those infected with either hepatitis B or C are ignorant of their status, only realizing it when their infection flares into cirrhosis or liver cancer. There is very limited public awareness of the disease. And then there is the silence of stigma, the unwillingness to talk about infections associated with sexual activity and drug use, even though the majority of hepatitis B infections occur during childbirth and until 1992 hepatitis C could be contracted through blood transfusions.

A comprehensive, national approach to viral hepatitis prevention and treatment should be undertaken to break through the silence and stigma, says a recent report by the Institute of Medicine. The disease affects up to 5.3 million Americans — and one out of every 12 people worldwide — and accounts for nearly half the liver transplants performed in the United States.

Effective treatments are available for the majority with chronic hepatitis B or C. Vaccination can prevent hepatitis B infection, but health care and social service providers’ knowledge about hepatitis B and C is generally poor, and many fail to follow guidelines for screening patients and providing care and services. Moreover, these services are fragmented among providers and organizations, leading to missed opportunities. A more coordinated approach includes improved identification of infected individuals and medical management of those with chronic infection. The onus is not just on traditional health care venues; organizations that provide services to at-risk populations, including prisons, Asian-American outreach groups,

HEPATITIS



HIV and STD clinics, and shelter-based programs, have key roles to play, too.

Steps also need to be taken to eliminate the stigma associated with viral hepatitis. Negative attitudes about hepatitis B in Asian cultures where the disease is endemic may contribute to immigrants’ reluctance to seek testing. In China, for example, people who test positive face job and social discrimination. In addition, negative perceptions about illicit-drug users, who are at greatest risk for hepatitis C, can affect the care they receive or their willingness to seek treatment.

The report recommends a public awareness initiative along the lines of the effort that succeeded in increasing recognition of HIV/AIDS and reducing its stigma. Educational programs and materials about viral hepatitis should be developed and made available to all health professionals and social service providers. — *Christine Stencel*

■ Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C. Committee on the Prevention and Control of Viral Hepatitis Infections, Board on Population Health and Public Health Practice, Institute of Medicine (2010, 252 pp.; ISBN 0-309-14628-3; available from the National Academies Press, tel. 1-800-624-6242; \$39.00 plus \$5.00 shipping for single copies; also on the Internet at <www.nap.edu/catalog/12793.html>).

The committee was chaired by **R. Palmer Beasley**, professor of epidemiology and disease control, University of Texas School of Public Health, Houston. The study was funded by the U.S. Centers for Disease Control and Prevention, U.S. Department of Health and Human Services’ Office of Minority Health, U.S. Department of Veterans Affairs, and the National Viral Hepatitis Roundtable.

THE BEST WAY TO TEACH A TEACHER?



No Single Approach Gets an "A"

The paths people follow to enter the teaching profession have never been uniform, but the traditional route has long been to get a degree in education from a college or university before joining the teaching work force. In recent years, though, the number of “alternative” programs — Teach for America being the most famous among them — has grown. Often designed to meet local shortages of teachers, these programs recruit people who do not have traditional education degrees, give them instruction and hands-on practice in the classroom, and move them into the world of teaching without granting a formal degree. About 130 such programs exist, and they train 20 percent to 30 percent of the 200,000 teachers who enter the profession each year. The growth of alternative programs has fueled a debate within the education community about which path — traditional or alternative — is more effective.

A new report from the National Research Council finds that there’s no evidence that either pathway produces better teachers and concludes that the distinction between “traditional” and “alternative” isn’t particularly useful. There is broad overlap in the content

and more difference within each pathway than there is between them, said the committee that wrote the report, noting that a program categorized as alternative in one state might be considered traditional in another.

In fact, there is currently little definitive evidence that any particular approach to teacher preparation yields teachers whose students are more successful than others, the report says; research simply hasn't looked closely enough at the specific factors that may ultimately affect student learning — such as the particular components of teacher prep programs or whether teachers' coursework is completed before they start teaching. This lack of research is leaving policymakers and teacher educators on shaky empirical ground when deciding what types of teacher preparation to encourage. Research should look explicitly at links between how teachers are prepared and how well their students learn, the report says. Such studies would be easier to conduct if researchers had richer measures of teacher preparation and student learning — more than data about teachers' degrees and students' test scores. While data on degrees and test scores are readily available and easy to use, they don't give a complete picture of the complex process leading from teacher preparation to student learning.

The report does conclude that both strong knowledge of content and familiarity with how students learn a particular subject are important for reading, math, and science teachers, and it found some weaknesses in how those who teach the



latter two disciplines are prepared. Many, perhaps most, math teachers lack the level of preparation in mathematics and teaching that the professional community deems adequate. And unacceptable high numbers of teachers of middle- and high-school math courses are teaching outside the field for which they trained.

All of the needed studies will depend on researchers having data to evaluate, and currently there is very little being collected on how teachers are prepared in the U.S., the report says. It urges the U.S. Department of Education to take the lead in encouraging new data collection efforts and coordinating existing ones. The end goal should be to develop a national education data network that includes comprehensive data on teacher education throughout the nation. With new research and data, the report says, policymakers and teacher educators will at last have a foundation to guide decisions that ultimately affect the educational outcomes of American students. — *Sara Frueh*

■ Preparing Teachers: Building Evidence for Sound Policy. Committee on the Study of Teacher Preparation Programs in the United States, Center for Education, Division of Behavioral and Social Sciences and Education (2010, 234 pp.; ISBN 0-309-12805-6; available from the National Academies Press, tel. 1-800-624-6242; \$44.00 plus \$5.00 shipping for single copies; also on the Internet at <www.nap.edu/catalog/12882.html>).

The committee was chaired by **Ellen Condiffe Lagemann**, Levy Institute Research Professor and senior scholar, Levy Economic Institute, Bard College, Annandale-on-Hudson, N.Y. The study was funded by the U.S. Department of Education, with additional support provided by the Ewing Marion Kauffman Foundation, the Spencer Foundation, and the Carnegie Corporation of New York.

COMING HOME

Easing the Transition for a New Generation of Veterans

As long as there have been wars, veterans returning home often have struggled to readjust to civilian life. But the wars in Iraq and Afghanistan are placing very different burdens on this generation of U.S. service members. Frequently, today's forces are deployed multiple times to dangerous war zones, exposing them to numerous stressors that might lead to post-traumatic stress disorder, depression, and a number of other psychiatric disorders. In addition, many veterans suffer from brain injuries and the long-lasting pathological conditions associated with such injuries.

All of these factors prompted Congress to ask the Institute of Medicine to re-evaluate how to help veterans and their families return to life after war. A preliminary report of the IOM's two-phase study identifies their most pressing needs; the second phase will examine additional studies now under way and provide more detailed findings and recommendations.

Anecdotal accounts from health care providers and service members indicate an overwhelming demand for mental health services, the report says, with long wait times for those seeking help. The departments of Defense and Veterans Affairs need to ensure there are enough providers available and in locations where they are most needed. Equally important is the need for DOD to develop policies that encourage service members to seek treatment.

Traumatic brain injury (TBI) has become known as the signature injury for veterans of the Iraq and Afghanistan wars. The VA has established a comprehensive system of treating these injuries initially, but the effects of TBI can persist for many decades. The department should

sponsor research to determine how to develop protocols for long-term management of TBI and multiple traumas.

In fact, the highest demand for veteran support services will occur in the decades ahead.

The report notes that requests for care and compensation by veterans of previous wars did not peak until 30 years or more after their service ended. To ensure that the nation is equipped, the VA should expand the role of its actuary — and Congress should appropriate funds — for annual long-term forecasts of costs associated with health and disability benefits for this population.

And to ease the immediate transition from war zone to civilian life, DOD should conduct a formal assessment of third-location decompression, which involves being sent for a number of weeks to an interim place before returning home. Veterans from other nations have reportedly found it helpful, but there is little formal research on the practice.

— Molly Galvin & Christine Stencel

■ Returning Home From Iraq and Afghanistan: Preliminary Assessment of Readjustment Needs of Veterans, Service Members, and Their Families. Committee on the Initial Assessment of Readjustment Needs of Military Personnel, Veterans, and Their Families, Board on the Health of Select Populations, Institute of Medicine (2010; 192 pp.; ISBN 0-309-14763-8; available from the National Academies Press; tel. 1-800-624-6242; \$43.25 plus \$5.00 shipping for single copies; also on the Internet at <www.nap.edu/catalog/12812.html>).

The committee was chaired by **George W. Rutherford**, Salvatore Pablo Lucia Professor and vice chair, department of epidemiology and biostatistics; and director, prevention and public health group, Global Health Sciences, University of California, San Francisco. The study was funded by the U.S. Department of Defense.





RESTORING THE HOME OF SCIENCE

Strolling around the National Academy of Sciences building is like taking a journey through the history of science. Rising to the height of 56 feet, the dome and arches of the building's Great Hall are lined with scientific emblems and inscriptions. At the center is a sun surrounded by planets, and eight disciplines of science are depicted. High on the north wall hangs a mural of Prometheus stealing fire from the sun god Helios to

bring mankind the flame of knowledge; and beautiful bronze doors and panels with symbols and figures from science emblazon the southern facade of the building.

While the Great Hall appears to be in perfect condition, it is not, nor is the rest of the historic home of the Academy on Constitution Avenue. After 86 years of exposure to the elements, the Great Hall is being cleaned as part of a major restoration project, which began this summer.

The project will improve the building's historic spaces, increase accessibility, and bring aging infrastructure and facilities into the 21st century.

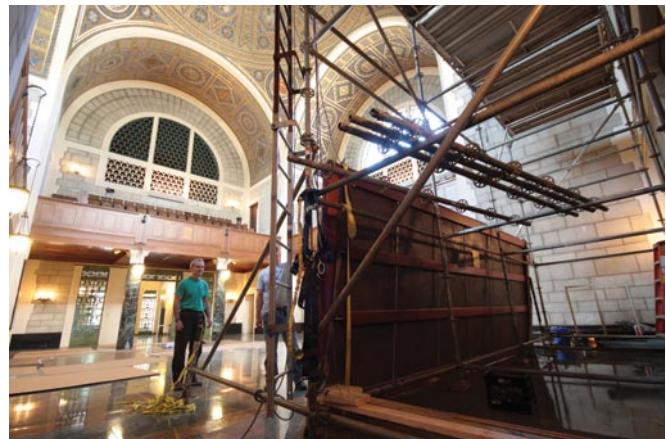
The building was designed by architect Bertram Grosvenor Goodhue, and on April 28, 1924, President Calvin Coolidge dedicated it as "the Temple of Science in America," saying, "It is not a place of mystery, but one to lead the public in thinking deeply and seeing how research can explain fundamental problems."

Improving the building's energy efficiency is a priority. The installation of more efficient heating and cooling systems and use of solar power will reduce energy consumption by an estimated 40 percent. The two-year project will also restore the building's exterior damaged by age and weather; reconfigure the meeting rooms to create a modern conference center; replace antiquated infrastructure with modern communication networks; replace part of the roof and drainage system; and improve accessibility to the disabled and ease of navigation for all visitors.

During the restoration, many of the meetings usually held at the NAS building will take place at the Keck Center of the National Academies. The Einstein Memorial Statue, a favorite for locals and tourists, will remain open during the restoration.

Photos and updated information about the restoration are available through the NAS Cultural Programs office at <www.nasonline.org/site/PageServer?pagename=Connect_visit_restoration>.

— Maureen O'Leary



Publications

For documents shown as available from the National Academies Press (NAP), write to 500 Fifth St., N.W., Lockbox 285, Washington, D.C. 20055; tel. 202-334-3313 or 1-800-624-6242; or order on the Internet at <www.nap.edu>. Documents from a specific unit of the National Academies are available from the source as noted.

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