

2017



Annual Report



NATIONAL
ACADEMY
of MEDICINE

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About the National Academy of Medicine

Founded in 1970 as the Institute of Medicine, the National Academy of Medicine (NAM) is one of three academies that make up the National Academies of Sciences, Engineering, and Medicine (the National Academies). Operating under the 1863 congressional charter of the National Academy of Sciences, the National Academies provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The National Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

The National Academy of Medicine is:

An independent, evidence-based scientific advisor. To carry out our work, we harness the talents and expertise of accomplished, thoughtful volunteers and undertake meticulous processes to avoid and balance bias. Our foundational goal is to be the nation's most reliable source for credible scientific and policy advice on matters concerning human health.

A national academy with global scope. Although the National Academies were originally created to advise the U.S. government and advance the well-being of the U.S. population, our mandate is now much broader. The NAM includes members from across the globe and partners with organizations worldwide to address challenges that affect us all.

Committed to catalyzing action and achieving impact. We identify and generate momentum around critical issues in health; marshal diverse expertise to build evidence-based solutions; inspire action through collaboration and public engagement; and foster the next generation of leaders and innovators.

Collaborative and interdisciplinary. In partnership with the National Academy of Sciences, the National Academy of Engineering, and other stakeholders, the NAM draws on expertise across disciplines and domains to advance science, medicine, technology, and health.

An honorific society for exceptional leaders. The NAM has more than 2,000 members elected by their peers in recognition of outstanding achievement. Through a commitment to volunteer service, NAM members help guide the work and advance the mission of the NAM and the National Academies.



NAM President **Victor J. Dzau, MD**, addresses members at the 2017 Annual Meeting.

Letter from the President

For nearly 50 years, since its founding as the Institute of Medicine, the National Academy of Medicine (NAM) has been committed to upholding the essential role of science and evidence in improving human health.

Today, amid unprecedented challenges in the United States and worldwide—from the erosion of scientific authority in public discourse to devastating natural disasters, infectious disease outbreaks, and gun violence—that foundational commitment has never been more important.

In this report, we share recent highlights from the NAM's programs, which are working to advance science, inform policy, and improve health across many fronts. We also acknowledge the contributions of NAM members, volunteers, and donors in 2017, whose expertise, commitment, and support makes our important work possible.

During the past year, we spoke out more strongly than ever before in defense of science and evidence as the north star for effective policy making. As challenges emerged, I am proud that we were able to respond quickly with authoritative guidance. For example, when misinformation spread about health risks from vaccines—leading to a preventable outbreak of measles in Michigan—we redistributed our extensive body of evidence on vaccines' proven safety and immense societal benefit.

After the catastrophic string of hurricanes in Florida, Texas, and Puerto Rico, we leveraged our series of reports on disaster preparedness and response to advise officials from the U.S. Department of Health and Human Services and the Federal Emergency Management Agency about how to rebuild communities to promote better health and greater resilience in the future.

Following the tragic mass shootings in Las Vegas and Parkland, we drew on the 2013 report *Priorities for Research to Reduce the Threat of Firearm-Related Violence* to urge the adoption of a thorough public health research agenda to stem the epidemic of violence. I am pleased that Congress clarified the spending bill provision known as the Dickey Amendment, which had acted as a decades-long legislative barrier to federally funded firearm research. Finally, there is a pathway to an evidence-based analysis of one of the most important issues of our time.

Of course, we must do far more than look to our past work to inform current challenges. As we approach the 50th anniversary of our founding in 1970, we are turning our attention to the next five decades and mapping the greatest priorities and opportunities in health. We have just completed a strategic plan (described further on page 11) to guide our work and build an infrastructure that will sustain our mission for decades to come.

Among several overarching goals is the imperative to “lead and inspire action on bold ideas to impact science, medicine, policy, and health equity domestically and globally.” We are preparing to face some of the monumental challenges and opportunities before us, such as the aging global population, the fragility of our ecosystems, the growing threat of pandemic disease, and technological frontiers that were unimaginable just a few years ago.

Continued

To meet the needs of the future, we must break down barriers and embrace the convergence of scientific disciplines. We must equip the scientific and medical workforces of the future with the appropriate skills and an ethical framework to navigate a rapidly changing landscape. We must

address disparities in health and access to care worldwide. We must create policy and incentives that reward innovation and ensure scientific advancement. And we must build the tools and mindset required to confront a multitude of challenges we cannot yet anticipate.

I look forward with pride and determination to another year of progress toward our vision—a healthier future for everyone.

A handwritten signature in black ink, appearing to read "Victor".

Victor J. Dzau, MD

2018-2019 NAM Council

The National Academy of Medicine is governed by a Council composed of NAM members elected by the membership.

Victor J. Dzau, MD (Chair)

Margaret Hamburg, MD
(Foreign Secretary); President,
American Association for the
Advancement of Science

Jane E. Henney, MD
(Home Secretary)

Keith R. Yamamoto, PhD
(Vice Chair); Vice Chancellor for
Science Policy and Strategy;
Vice Dean for Research, School
of Medicine; Professor, Cellular
& Molecular Pharmacology,
University of California,
San Francisco

Nancy Andrews, PhD, MD,
Vice Chancellor and Dean,
Duke University School of
Medicine

Jeffrey R. Balser, MD, PhD,
President and CEO, Vanderbilt
University Medical Center;
Dean, School of Medicine,
Vanderbilt University

Claire Brindis, DrPH, Caldwell
B. Esselstyn Chair in Health
Policy Studies; Director, Philip
R. Lee Institute for Health Policy
Studies; Professor of Pediatrics
and Health Policy; University of
California, San Francisco

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Knowles Professor of Law &
Bioethics, School of Law and
Department of Medical History
and Bioethics, School of Medi-
cine and Public Health, Univer-
sity of Wisconsin–Madison

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Department of Pediatrics and
Department of Preventive
Medicine, Icahn School of Medi-
cine at Mount Sinai

Mark C. Fishman, MD,
Professor of Stem Cell and
Regenerative Biology, Harvard
University

Linda P. Fried, MD, MPH,
Dean and DeLamar Profes-
sor of Public Health, Joseph
L. Mailman School of Public
Health, Columbia University;
Professor of Epidemiology
and Medicine; Senior Vice
President, Columbia Univer-
sity Medical Center

**Elena Fuentes-Afflick, MD,
MPH,** Professor of Pediatrics;
Vice Dean for Academic Affairs;
University of California, San
Francisco

**Lynn R. Goldman, MD,
MPH,** Dean, School of Public
Health and Health Services;
Professor, Environmental
and Occupational Health, The
George Washington University

Eve J. Higginbotham, MD,
Vice Dean, Inclusion and Di-
versity; Senior Fellow, Leonard
Davis Institute of Health Eco-
nomics; Professor of Ophthal-
mology, Scheie Eye Institute;
Perelman School of Medicine,
University of Pennsylvania

Raynard Kington, MD, PhD,
President, Grinnell College

Story Landis, PhD, Scientist
Emeritus, National Institute of
Neurological Disorders and
Stroke

**Albert Reece, MD, PhD,
MBA,** Vice President for
Medical Affairs, University of
Maryland; John Z. and Akiko K.
Bowers Distinguished Profes-
sor and Dean, University of
Maryland School of Medicine

Sanford Schwartz, MD, Leon
Hess Professor of Medicine,
Health Management and
Economics, Perelman School
of Medicine and Wharton
School of Business, University
of Pennsylvania

*The NAM extends its gratitude to Council members whose terms end in July 2018: **Sheila Burke, MPA, RN,** Harvard Kennedy School; **Elaine Fuchs, PhD,** The Rockefeller University; **Diane Griffin, MD, PhD,** Johns Hopkins Bloomberg School of Public Health; **Steven Hyman, MD,** Broad Institute of Harvard and MIT; and **Gilbert Omenn, MD, PhD,** University of Michigan*

Organizational Chart

LEADERSHIP

Victor J. Dzau
President

Jane Henney
Home Secretary

Peggy Hamburg
Foreign Secretary

J. Michael McGinnis
Leonard D. Schaeffer Executive Officer

OPERATIONS

President's Office
Morgan Kanarek, *Chief of Staff*
Celynne Balatbat, *Special Assistant*

Finance & Administration
Adrienne Anzanello, *Director*

Communications
Laura DeStefano, *Director*

Membership & Governance
Meg McCoy, *Director*

Development
Jackie Wood, *Director*

Strategy, Evaluation, & Advancement
Anne-Marie Mazza, *Director*

PROGRAMS

Clinician Well-Being & Resilience
Charlee M. Alexander, *Director*

Innovation to Incubation
Ivory Clarke, *Director*

Culture of Health
Charlee M. Alexander, *Co-Director*
Ivory Clarke, *Co-Director*

**Leadership Consortium for a Value
& Science-Driven Health System**
J. Michael McGinnis, *Executive Director*
Michelle Johnston-Fleece,
Henrietta Osei-Anto, Y. Claire Wang, &
Danielle Whicher, *Directors*

Emerging Leaders Forum
Meg McCoy, *Co-Director*
Gregg Margolis, *Co-Director*

**Health Policy Fellowships
& Leadership Programs**
Gregg Margolis, *Director*

**Responding to the
U.S. Opioid Epidemic**
Elizabeth Finkelman, *Director*

Healthy Longevity
Elizabeth Finkelman, *Director*

**Vital Directions for
Health & Health Care**
Elizabeth Finkelman, *Director*

2018-2023 Strategic Plan

In July 2015, the Institute of Medicine was reconstituted as the National Academy of Medicine, beginning a new era for our organization. Meanwhile, the world in which we operate has undergone significant change.

To that end, we established a planning committee and engaged NAM members, volunteers, and other expert consultants in an 18-month process to develop a strategic plan that positions the organization for maximum impact over the next 5 years. The plan was completed in Fall 2017 and an implementation framework was approved by the NAM Council in early 2018.

The NAM remains committed above all to its central mandate to provide independent, objective, evidence-based advice on matters of medicine, health, biomedical sciences, and health policy. Building on this core scientific advisory function, the 2018-2023 plan adds an emphasis on health equity and highlights a global focus in addition to its longstanding domestic charge. To achieve this new organizational mission, the NAM will expand its advisory role to capitalize on its strength as a trusted convener with the ability to enlist new stakeholders and partners in the United States and throughout the world.

The plan elevates the NAM as an innovative, resourceful, dynamic organization and a continuously learning Academy that is adaptive, resilient, and effective in a rapidly changing environment. As such, the plan is not prescriptive, but rather is designed to provide

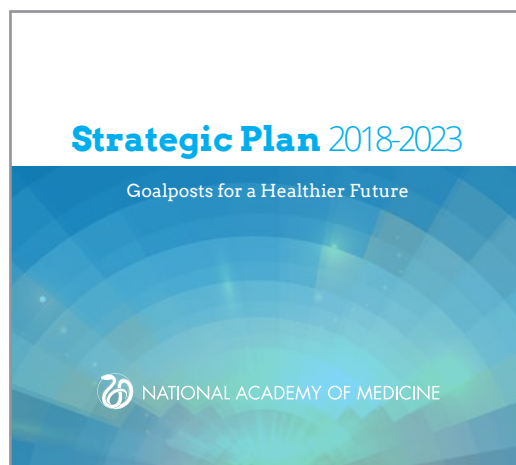
strategic guidance in ways that will advance the mission. The plan follows a roadmap that starts with “game-changing” bold ideas and key leverage points that can achieve significant impact on health and health equity. Next, it identifies stakeholders, actions, resources, and outcomes for a program of activities to achieve the mission. Key to success of the mission will be marshaling the necessary resources to implement these activities. Finally, evaluating both processes and outcomes across activities

will inform future programming and actions that advance the mission. Importantly, the plan also builds on the NAM’s strengths, including who we are as an organization and our core values.

We identified three goals that will allow us to extend our advisory role to inspire action in the United States and globally; activate our membership and

engage and nurture the next generation of leaders to advance our mission; and build the field for the future by bridging multiple disciplines and inspiring diverse young people to contribute to the fields of health and medicine.

An outline of the 2018-2023 plan appears on the following page. To read the complete plan, visit nam.edu/2018StrategicPlan



NAM Strategic Plan At a Glance

MISSION	To improve health for all by advancing science, accelerating health equity, and providing independent, authoritative, and trusted advice nationally and globally.
VISION	A healthy future for everyone.
VALUES	Scientific excellence and rigor. Objectivity and independence. Diversity, inclusion, and equity.
STRATEGIC GOALS	Actively identify and address critical issues with balanced and authoritative scientific evidence; and lead and inspire action on bold ideas to impact science, medicine, policy, and health equity domestically and globally. Diversify and activate the membership of the Academy and engage emerging leaders and scholars to enhance our leadership capacity and address new contexts and challenges. Build leadership capacity across diverse disciplines to shape the future of health and medicine.
FOUNDATIONAL ACTIVITIES	Increase the Academy's capacity. Expand partnerships. Engage globally. Monitor and evaluate progress.

Three core priorities guide the NAM's work: 1) responding to critical and pressing issues; 2) advising the nation and the world on the future of health and health care; and 3) leading and inspiring for the future. In the sections that follow, learn about our recent progress toward each of these goals.

Responding to Critical & Pressing Issues



Collective Action to Combat Clinician Burnout

NAM Action Collaborative on Clinician Well-Being & Resilience

Clinicians of all kinds—including physicians, nurses, dentists, pharmacists, trainees, and others—are experiencing burnout at alarming rates. Burnout is a syndrome characterized by a high degree of emotional exhaustion and depersonalization and a low sense of personal accomplishment at work. Burnout can have serious, wide-ranging consequences, from reduced job performance to—in the most extreme cases—clinical errors or suicide. In short, burnout not only causes significant personal suffering, but threatens the overall function of our health system.

We know that burnout is a systems issue driven by factors largely outside the control of individual clinicians. Therefore, building a system that promotes well-being requires buy-in

and action from multiple stakeholders—including health system leaders, policy makers, insurers, health IT vendors, researchers, educators, clinicians, trainees, and patients.

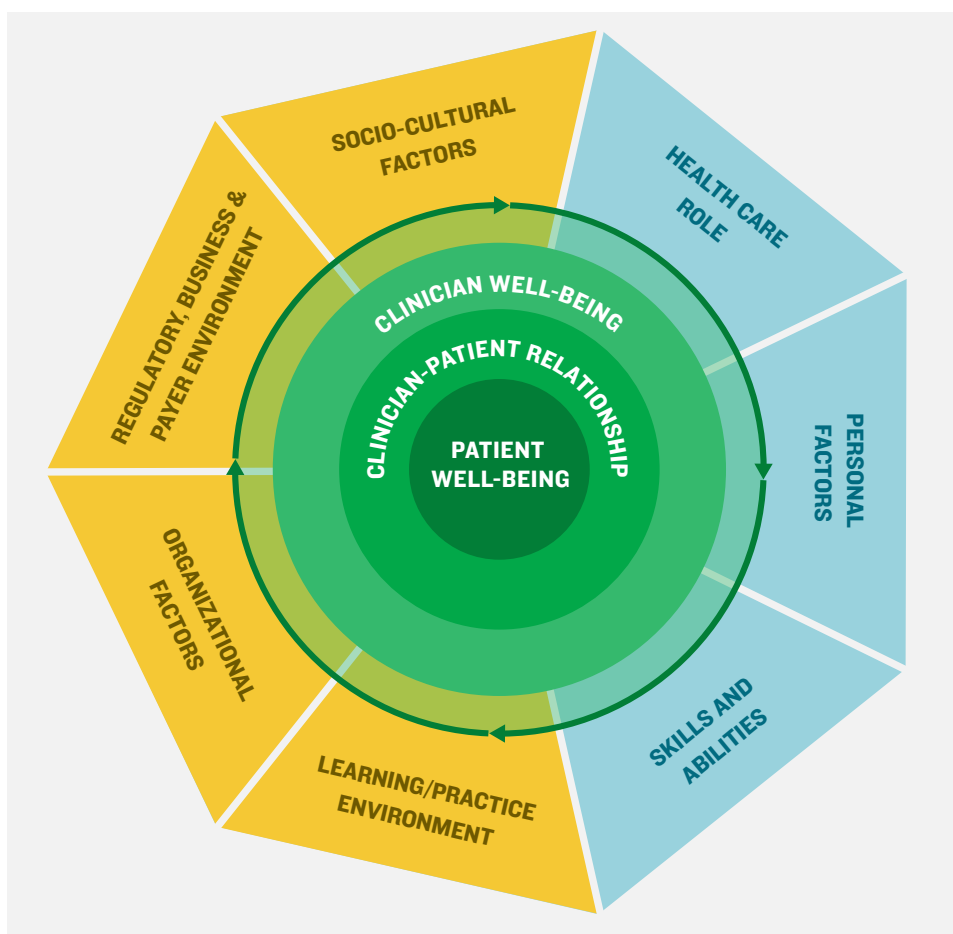
To that end, the NAM launched the Action Collaborative on Clinician Well-Being & Resilience, a network of more than 60 organizations committed to reversing trends in clinician burnout. Chaired by NAM president Victor J. Dzau and co-chaired by Darrell Kirch, president and CEO of the Association of American Medical Colleges, and Thomas Nasca, CEO of the Accreditation Council for Graduate Medical Education, the Action Collaborative has three primary goals:

1. Improve baseline understanding of challenges to clinician well-being.
2. Raise the visibility of clinician stress and burnout.
3. Elevate evidence-based, multidisciplinary solutions that will improve patient care by caring for the caregiver.

Since its launch in January 2017, notable accomplishments of the Action Collaborative include multiple publications and public events, including a congressional briefing; the collection of more than 150 formal statements of commitment from organizations working to promote clinician well-being; a comprehensive conceptual model to characterize the factors that influence clinician well-being (below); and an online knowledge hub to share resources and promote solutions.

In late 2017, participants unanimously agreed to extend the term of the Action Collaborative for another two years (through 2020). The NAM will launch a consensus study in June 2018 on systems approaches to improve patient care by supporting clinician well-being.

To access resources from the Action Collaborative and learn how you can get involved, visit nam.edu/CW.



A snapshot from the **Conceptual Model of Factors Affecting Clinician Well-Being and Resilience**; for the complete model, visit nam.edu/ClinicianWellBeing.

Resources Available from the Action Collaborative on Clinician Well-Being & Resilience



Clinician Well-Being Knowledge Hub

The **Clinician Well-Being Knowledge Hub** is a first-of-its-kind comprehensive resource repository to help organizations learn more about clinician burnout and the solutions that promise a brighter, healthier future. The knowledge hub includes research articles, news articles, blog posts, toolkits, reports, and briefs that provide further insight into the causes of clinician burnout; its consequences for health care professionals, patients, and their families; and innovative approaches that organizations can take to promote well-being.

Other Tools

- **Conceptual Model: Factors Affecting Clinician Well-Being and Resilience**
- **Validated Instruments to Assess Work-Related Dimensions of Well-Being**

Selected Publications

- **Burnout Among Health Care Professionals: A Call to Explore and Address This Underrecognized Threat to Safe, High-Quality Care** (Dyrbye, L., T. D. Shanafelt, C. A. Sinsky, P. F. Cipriano, J. Bhatt, A. K. Ommaya, C. P. West, and D. Meyers; *NAM Perspectives*)
- **A Journey to Construct an All-Encompassing Conceptual Model of Factors Affecting Clinician Well-Being and Resilience** (Brigham, T., C. Barden, A. Legreid Dopp, A. Hengerer, J. Kaplan, B. Malone, C. Martin, M. McHugh, and L. M. Nora; *NAM Perspectives*)
- **Care-Centered Clinical Documentation in the Digital Environment: Solutions to Alleviate Burnout** (Ommaya, A. K., P. F. Cipriano, D. B. Hoyt, K. A. Horvath, P. Tang, H. L. Paz, M. S. DeFrancesco, S. T. Hingle, S. Butler, and C. A. Sinsky; *NAM Perspectives*)
- **Nurse Suicide: Breaking the Silence** (Davidson, J., J. Mendis, A. R. Stuck, G. DeMichele, and S. Zisook; *NAM Perspectives*)



Building an International Scientific Framework for Human Genome Editing

A Joint Initiative of the NAM and the National Academy of Sciences

Powerful new gene-editing technologies, such as CRISPR-Cas9, hold great promise for advancing science and treating disease (such as sickle cell anemia, pictured above), but they also raise concerns and present complex challenges, particularly because of their potential to be used to make genetic changes that could be passed on to future generations, thereby modifying the human germline.

In keeping with the National Academies' past leadership on controversial new areas of genetic research, such as recombinant DNA technology, human embryonic stem cell research, human cloning, and "gain-of-function" research, the NAM and the National Academy of Sciences (NAS) launched a human gene-editing initiative to provide researchers, clinicians, policy makers, and societies around

the world with a comprehensive understanding of human gene editing to help inform decision-making about this research and its application.

In early 2017, the NAM and NAS released the consensus study ***Human Genome Editing: Science, Governance, and Ethics***.

The study provides recommendations to guide international use of gene editing technologies in the following areas: basic laboratory research, somatic genome editing, germline (heritable) genome editing, genetic enhancement, and public engagement. The report has been downloaded in 149 countries. Access the report and related materials at nationalacademies.org/GeneEditing.

The study followed a 2015 International Summit on Human Gene Editing, which was cohosted by the NAM, NAS, Chinese Academy of Sciences, and the UK Royal Society. Planning is currently under way for a second international summit in Hong Kong in November 2018 to build on the report's recommendations.



Confronting the U.S. Opioid Epidemic

The opioid epidemic is now the most lethal and far-reaching public health threat facing the nation. Nearly 65,000 Americans died from a drug overdose in 2016, a 21 percent increase over the previous year—making drug overdose the leading cause of death among Americans under age 50. Nearly half of opioid overdose deaths in 2016 were related to medications obtained legally by prescription, sparking deep concern among leaders in the health care sector. There is a clear need for clinicians to join forces with government, law enforcement, community organizations, and other stakeholders to develop solutions that will prevent future opioid misuse and aid individuals and communities currently in the grip of a formidable addiction.

In July 2017, the National Academies released the consensus report ***Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use.***

Commissioned by the U.S. Food and Drug Administration (FDA) as part of its Opioids Action Plan, the report contains recommendations for state and federal agencies, health professional organizations, and research sponsors. In early 2018, the National Academies began working with the FDA to develop a statement of task for a possible follow-up study that will focus on prescribing guidelines. Download the report at [nationalacademies.org/OpioidStudy](https://www.nationalacademies.org/OpioidStudy).

Clinician leadership, including appropriate prescribing, is also the subject of an NAM special publication completed at the request of the National Governors Association in September 2017. ***First Do No Harm: Marshaling Clinician Leadership to Counter the Opioid Epidemic*** is informed by, and builds on, existing professional initiatives and guidelines to offer axioms for responsible prescribing practices and recognition and treatment of substance use disorder; as

well as actions clinicians can take to improve the skills, effectiveness, and care capacity essential in the face of the growing need. Download the special publication at nam.edu/FirstDoNoHarm.

In October 2017, days before President Donald Trump declared the opioid crisis a public health emergency, the opioid epidemic was the subject of the annual **President's Forum** at the NAM Annual Meeting. NAM president Victor Dzau led a dynamic discussion about challenges and possible cross-sectoral solutions among VADM Jerome Adams, U.S. Surgeon General; Charles Baker, Governor of Massachusetts; Scott Gottlieb, Commissioner of the FDA; Steve Leifman, a judge in the Miami-Dade County Court; and Kathleen Sebelius, former Secretary of the U.S. Department of Health and Human Services.

The discussion continued, this time from the lens of alternative therapies to opioids, at the annual **Richard and Hinda Rosenthal Symposium**. Co-hosted by the University of Michigan, the symposium featured a

keynote address on “The Future of Chronic Pain Management: From Non-Opioid Drugs to Antibodies to Cell Transplants” by Allan Basbaum of the University of California, San Francisco. Access the recording at nam.edu/Rosenthal2017.

The NAM recognizes that more is needed than research and conversation. The epidemic is not abating. Therefore, in 2018 and the years ahead, we are assembling an Action Collaborative to unite government, health leaders, community organizations, law enforcement, and other stakeholders around common goals and facilitate coordinated, short-term action. In particular, the Collaborative will focus on prescribing guidelines, clinician education across the continuum of care, and treatment of addiction.

The National Academies are also working with FDA and the National Institute on Drug Abuse on two additional consensus studies to examine appropriate prescribing and medication-assisted treatment.



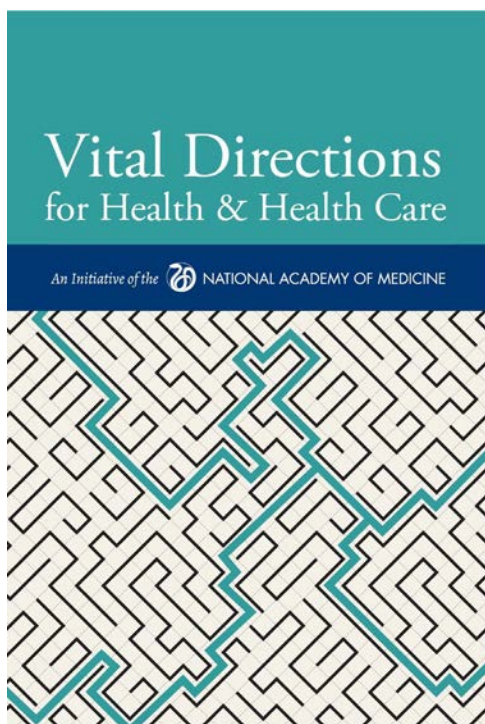
FDA Commissioner **Scott Gottlieb**, Miami-Dade County Judge **Steve Leifman**, and U.S. Surgeon General **VADM Jerome Adams** talk during the President's Forum at the 2017 NAM Annual Meeting (not pictured: former HHS Secretary Kathleen Sebelius and Massachusetts Governor Charles Baker)

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Advising the Nation & the World on the Future of Health & Health Care

Guiding Policy for Better Health & Health Care

What can be more vital to each of us than our health? Yet, despite unprecedented health care spending, the U.S. health system is substantially underperforming, especially with respect to what should be possible, given current knowledge.



Although the United States is currently devoting 18% of its Gross Domestic Product to delivering medical care—more than \$3 trillion annually and nearly double the expenditure of other advanced industrialized countries—the U.S. health system ranked only 37th in performance in a World Health Organization assessment of member nations.

In its **Vital Directions for Health & Health Care Initiative**, the NAM marshaled the wisdom of more than 150 of the nation's best researchers and health policy experts to as-

sess opportunities for substantially improving the health and well-being of Americans, the quality of care delivered, and the contributions of science and technology. Months before the 2016 U.S. presidential election, the NAM published the experts' recommendations in 19 discussion papers and a companion series in the *Journal of the American Medical Association*.

In March 2017, the Vital Directions steering committee issued a final paper synthesizing the existing findings and recommending eight streamlined priorities for policy makers to improve U.S. health and health care. Following a public press conference to announce the priorities, NAM leadership met extensively with members of Congress and the Executive Branch to promote their use of Vital Directions as a policy blueprint.

The complete collection of papers is now available as an NAM special publication (download at nam.edu/vitaldirections). The collection identifies practical and affordable steps that can and must be taken across eight action and infrastructure priorities, ranging from paying for value and connecting care, to measuring what matters most and accelerating the capture of real-world evidence. Without understating the difficulty of the changes needed, in Vital Directions the NAM offers an important resource and actionable steps for health, policy, and leaders at all levels to achieve better health outcomes at lower cost.

Vital Directions for Health & Health Care

A Checklist for Policy-Makers



Pay for value—*deliver better health and better results for all*

- Tie payments and incentives to value and outcomes
- Help clinicians develop the core competencies they need to succeed
- Advance care and payment models that integrate medical and non-medical services



Empower people—*democratize action for health*

- Link care with personal context
- Ensure health care information is available, understandable, and useful for all
- Promote effective telehealth tools and clinician links to patients and families
- Guarantee patients access, ownership, and protection of their health data



Activate communities—*collaborate locally to mobilize resources for health*

- Invest in local leadership and capacity to drive community health collaboration and initiatives
- Strengthen community-based assessment and strategies targeting high-need individuals
- Build strong state-based capacity to guide, assist, and coordinate local health efforts



Connect care—*implement seamless digital interfaces for the best care*

- Ensure clinical data accessibility and use through infrastructure and regulatory changes
- Enforce principles and standards for end-to-end (system/clinician/individual) interoperability
- Implement data and IT strategies that promote a continuously learning health system



Measure what matters most—*use consistent core metrics*

- Focus reliably and consistently on the factors most important to better health and care
- Create the national capacity to identify, standardize, implement, and revise core measures
- Invest in the science of performance measurement



Modernize skills—*train 21st-century health care & science workforces*

- Reform health workforce training to emphasize teams, innovation, and continuous improvement
- Create new education and training pathways to maintain a robust science workforce



Accelerate real-world evidence—*integrate clinical care data for progress*

- Draw on real-world clinical data to accelerate knowledge & improve care, outcomes, & innovation
- Foster a culture of data sharing by strengthening incentives and standards
- Partner with patients and families to invest them in evidence generation and data sharing



Advance science—*forge innovation-ready research and partnerships*

- Promote practices and policies for scientific innovation and collaboration
- Support an adaptive and patient-engaged regulatory framework
- Foster cross-disciplinary and public-private partnerships for continuous learning



Advancing Health Equity

Building a Culture of Health

The NAM's Culture of Health Program (COHP) is a multiyear collaborative effort to identify strategies to create and sustain conditions that support equitable good health for everyone in America. With the oversight of an expert advisory committee, the COHP is working toward four primary goals:

1. **Lead:** Build a knowledge base to inform actions and partnerships that will advance health equity
2. **Translate:** Bridge science to action for measurable progress
3. **Impact:** Strengthen capacity in communities and inform legal, policy, and system reform
4. **Sustain:** Transform culture to accelerate progress in areas that still have significant health disparities

In 2017, the first COHP consensus study was published: ***Communities in Action: Pathways to Health Equity***. The study examined nine exemplar communities across the United States to highlight promising community-based solutions in the context of 1) key levers, such as policies; 2) key relationships, such as cross-sectoral partnerships; and 3) other elements needed to be successful.

To translate the science and equip stakeholders with concise, actionable information, a suite of dissemination materials are available at nationalacademies.org/healthequityhub. These include a conceptual model; targeted briefs for sectors including transportation, education, faith-based groups, businesses, foundations, and many more; and a comic book version of the report's recommendations.

The NAM also created a first-of-its-kind short documentary series titled ***Communities Driving Health Equity***. This collection of three 5-minute videos uses storytelling to tangibly

share lessons from three of the community organizations featured in the consensus report: People United for Sustainable Housing in Buffalo, NY; Indianapolis Congregation Action Network (now Faith in Indiana) in Indianapolis, IN; and Kokua Kalihi Valley Comprehensive Family Services in Honolulu, HI. Collectively, the films have been viewed more than 100,000 times, far exceeding past benchmarks. See the documentaries at nam.edu/drivinghealthequity.

To build on findings from the initial nine communities studied, the NAM visited 11 additional communities during summer 2017. We collected information about the key principles that guide each organization's work; which social determinants of health are of greatest concern; and which partnerships are most essential to enable their work. A synthesis of this research, along with community case studies, will be made available in 2018.

Three new consensus studies—on health equity concerns in the prenatal through early childhood years and adolescence, respectively, and on integration of health and social needs care—have been launched and are due for publication in 2019.

Finally, to engage audiences at the community level and broaden the conversation about health equity, the NAM hosted its first-ever community art show, **"Visualize Health Equity."** We called on people across the country to submit artwork of all kinds—visual, writing, music, film, and more—to share what health equity looks, feels, and sounds like to them. Thirty pieces were displayed as an interactive component of a COHP stakeholder meeting in November 2017, and 100 pieces are on display in a permanent online gallery at nam.edu/visualizehealthequity. As an exciting example of impact, groups across the nation—including health departments, universities, and libraries—are now hosting their own versions of the show.



Above: Scenes from *Communities Driving Health Equity* documentary series

Selections from the Visualize Health Equity Art Show

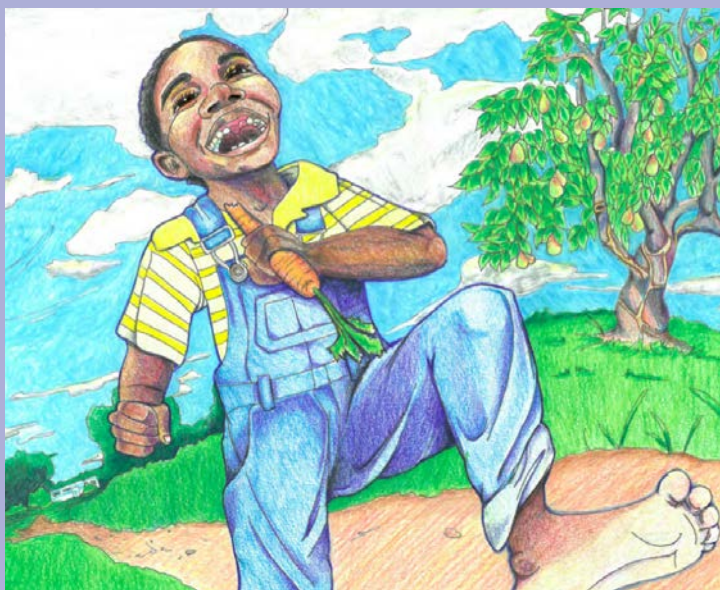
nam.edu/VisualizeHealthEquity



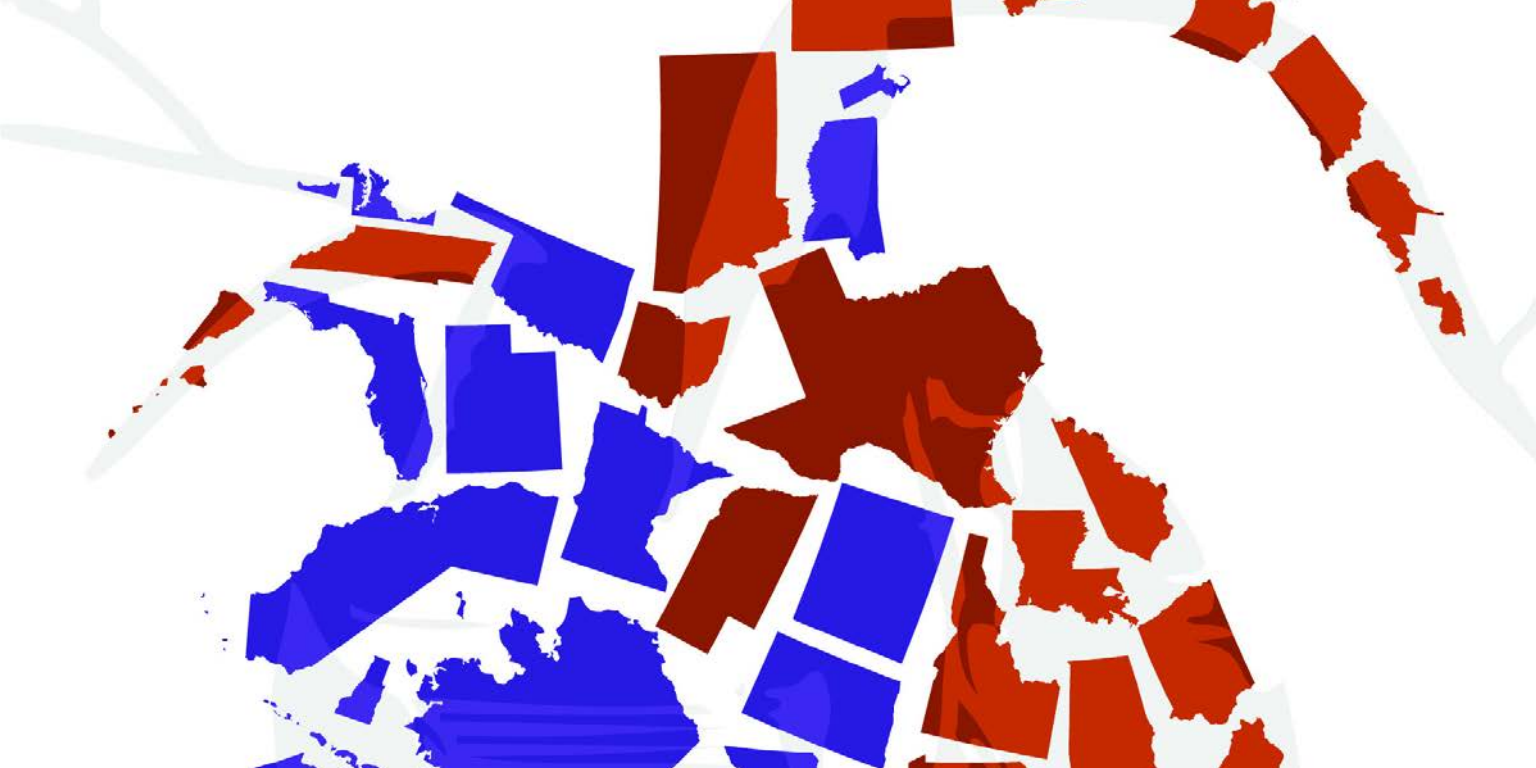
"Imagine Belonging" by Connie Cagampang Heller



"Family Matters" by Birmingham
AIDS Outreach - Magic City Acceptance
Center (portion)



"Cole Blue, Full of Valor" by Mia Keays and Brittney Washington (portion)



Measuring What Matters Most to Improve the U.S. Health System

The NAM Vital Signs Initiative

Thousands of measures are in use today to assess health and health care in the United States. Although many provide useful information, the sheer number of measures, as well as their lack of focus, consistency, and organization, limits their overall effectiveness in improving performance. What are the core measures that will pinpoint health system performance and yield targets for progress?

The 2015 consensus report ***Vital Signs: Core Metrics for Health and Health Care Progress*** proposed a streamlined set of 15 standardized measures, with recommendations for their standardization and application at every level—national, state, local, and institutional. Successful implementation of the core measures will depend on their relevance, reliability, and utility to multiple stakeholders. To that end, the NAM's Leadership Consortium for a Value & Science-Driven Health System launched the **Vital Signs Initiative** to help

stakeholders at all levels apply and refine the core measures in their own contexts.

In partnership with the Public Health Institute and the Blue Shield of California Foundation, the NAM worked with two California counties—Fresno and Monterey—to pilot the measures. In addition to the 15 core measures recommended by the NAM, each county identified a sixteenth measure of particular importance to the local context (active transportation for Fresno; safety and violence prevention for Monterey). Participants agreed that the framework was useful and sustainable at the county level.

The state of Tennessee has also used the NAM's Vital Signs as the foundation for its new state health plan, introduced in September 2017. We are also working closely with leadership of the Centers for Medicare & Medicaid Services (CMS) to guide the direction of CMS's "Meaningful Measures" framework. Finally, a 2018 update on national progress according to the core measures is under way. More information: nam.edu/VitalSigns.



Promoting Patient and Family Leadership

A Framework for Patient- and Family-Engaged Care

Patient- and family-engaged care (PFEC) is planned, delivered, managed, and continuously improved in active partnership with patients and their families or care partners to ensure integration of their health and health care goals, preferences, and values. In a culture of PFEC, patients are not merely subjects of their care; they are active participants whose voices are honored. Family or care partners are not kept an arm's length away as spectators, but participate as integral members of their loved one's care team.

A prevalent and persistent challenge to PFEC is uncertainty about whether the resource investment required will lead to better results. There is also a lack of clarity about how, practically speaking, to make it happen. To address these barriers, the NAM's Leadership Consortium for a Value & Science-Driven Health

System convened a Scientific Advisory Panel to identify evidence-based strategies that facilitate patient and family engagement and have demonstrated outcomes. The panel drew on both the scientific evidence and the lived experiences of patients, their care partners, practitioners, and leaders to develop a comprehensive framework that identifies specific elements necessary to create and sustain a culture of PFEC. Download the framework at nam.edu/PFEC.

The PFEC framework was profiled in *Forbes* and the *British Medical Journal*, and its accompanying discussion paper was the second most downloaded *NAM Perspective* of 2017. The PFEC will inform future efforts of the **Patient and Family Leadership Network**, a vibrant virtual community that engages patients and families in serving as effective leaders and advisors to the NAM and others to achieve better culture, care, value, and health in a system that continuously learns and improves. Learn more at nam.edu/PFLN.

Improving Care for High-Need Patients

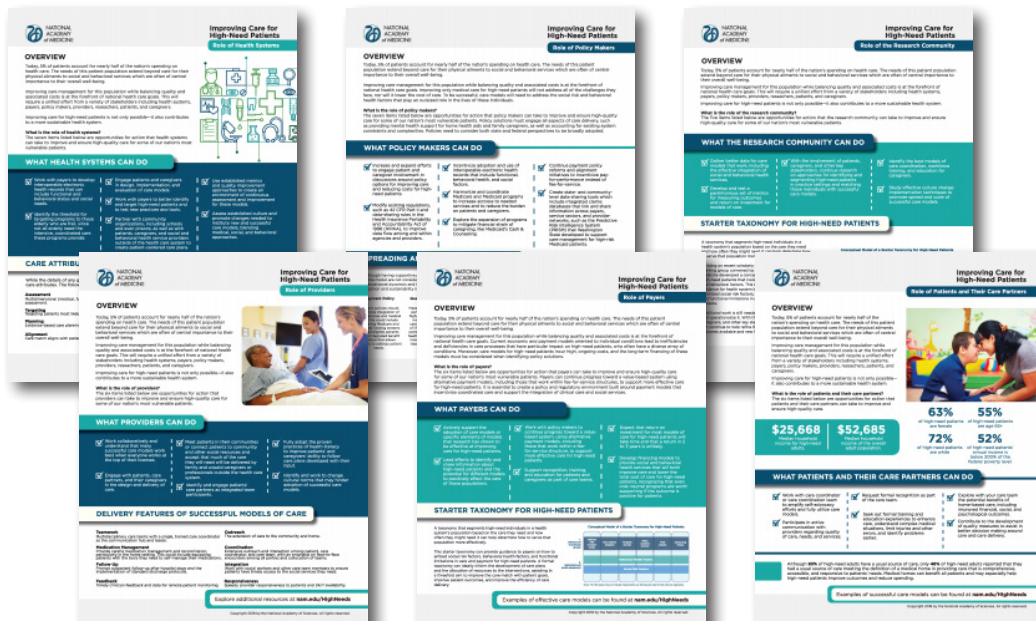
Today, 5 percent of patients account for nearly 50 percent of health care spending.

Improving care management for the patient population with the highest needs could both improve health outcomes and reduce costs. To that end, the NAM's Leadership Consortium for a Value & Science-Driven Health System assembled an expert steering committee and hosted three workshops to inform the NAM special publication ***Effective Care for High-Need Patients: Opportunities for Improving Outcomes, Value, and Health***. The publication 1) articulates the key characteristics of high-need patients; 2) proposes a patient taxonomy to help target care; 3) identifies promising care models and their attributes; and 4) highlights opportunities for action at the policy level to spread and scale evidence-based programs.

To facilitate awareness and uptake of promising models and attributes, the

NAM developed a comprehensive suite of dissemination activities, including tailored stakeholder action guides for health systems, policy makers, patients and their care providers, payers, providers, and the research community. The NAM also hosted a webinar series that featured interviews with leaders of programs across the country that have demonstrated success in improving care and outcomes for high-need patients: the Commonwealth Care Alliance in Boston, MA; Health Quality Partners in Doyleston, PA; and Health Share of Oregon in Portland, OR.

The NAM is currently collecting patient and caregiver testimonials to illustrate the ripple effect of receiving well-managed care based on evidence-based principles for improving outcomes and value. All resources are available at nam.edu/HighNeeds.



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Leading & Inspiring for the Future



Sparkling Social & Scientific Innovation to Prepare for Global Aging

Healthy Longevity Grand Challenge

Today, 8.5 percent of people worldwide are aged 65 and over. By 2050, this percentage is projected to more than double. Furthermore, the global population of the “oldest old”—people aged 80 and older—is expected to more than triple by 2050. At the current pace, population aging is poised to impose a significant strain on economies, health systems, and social structures worldwide. But it doesn't have to.

We can envision, just on the horizon, an explosion of potential new medicines, treatments, technologies, and preventive and social strategies that could help transform the way we age and ensure better health, function, and productivity during a period of extended longevity. Now is the time to support the next breakthroughs in healthy longevity, so that all of us can benefit from the tremendous opportunities they have to offer.

The NAM launched the Healthy Longevity Grand Challenge to catalyze transformative innovation and inform policies and priorities to advance healthy aging and longevity globally. The initiative has two components: a series of inducement prizes and awards and a comprehensive global roadmap report with recommendations for action. The combined objectives of the initiative are to:

- Catalyze breakthrough ideas and research that will extend the health- and activity-span into later life
- Achieve transformative and scalable innovation in healthy aging and longevity by translating evidence into action
- Provide a comprehensive assessment of the challenges and opportunities presented by global aging
- Build a broad ecosystem of support

Fundraising for both components is now underway; the global roadmap project is expected to launch by the end of 2018. Learn more: nam.edu/HealthyLongevity.

Sharing Science Through Storytelling

Introducing the “Films for a Healthier Future” documentary screening and discussion series

In today's competitive communications environment, it is ever more important to reach new and existing audiences through innovative means and help them connect personally with the role of science and evidence.

In 2017, the NAM launched a documentary screening and discussion series to open the doors of the institution to the general public and spark meaningful conversation about issues of concern in health and medicine.

The inaugural event in the series was the Washington, DC, premiere of *Unseen Enemy*, a film that explores the increasing threat of global pandemics through the lenses of Ebola, Zika, and influenza. The screening was followed by a panel discussion moderated by

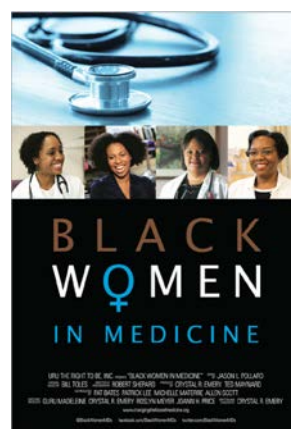
CNN Chief Medical Correspondent Sanjay Gupta.

Next, the NAM screened *Black Women in Medicine*, a documentary that illustrates challenges faced by black women physicians and celebrates the contributions they have made to the field. The screening was part of a “Changing the Face of STEM” event in conjunction with URU, The Right To Be, Inc., to promote diversity and inclusion in STEM.

The third film in the series was *The New Barbarianism*, which reveals a growing trend of violence against health and humanitarian workers in global conflict zones. At all three events, the films' directors were present alongside expert reactors to take questions from the audience.



Anthony Fauci, Director of the National Institute of Allergy and Infectious Disease, chats with **Sanjay Gupta**, CNN Chief Medical Correspondent, during the Washington, DC, premiere of *Unseen Enemy*



Engaging the Next Generation of Leaders

The National Academy of Medicine's Emerging Leaders Forum exists to increase the NAM's engagement with exceptional early- and mid-career professionals working in biomedical science, health care delivery, health policy, and related fields.

The Forum facilitates opportunities for mentorship, collaboration, and innovation between emerging leaders, NAM members, and experts across sectors. Forum members also provide valuable input and feedback to help shape the priorities of the NAM and sustain the NAM's impact and reputation as a national leader in advancing knowledge and accelerating progress in science, medicine, policy, and health equity. Forum members may publish in *NAM Perspectives*, participate in convening activities

throughout the larger National Academies, and take part in interest groups.

In 2017, inaugural members agreed on next steps for the Forum's development, including expansion of membership, establishment of 2-year terms, and plans for members to develop an annual spring symposium on a subject of interest to them. The first symposium is scheduled for April 2019. For more information, visit nam.edu/EmergingLeaders.



Inaugural members of the NAM Emerging Leaders Forum: **Gretchen Schwarze**, University of Wisconsin; **Sohail Tavazoie**, The Rockefeller University; **Diedra Crews**, Johns Hopkins University School of Medicine; **Sandeep Kishore**, Icahn School of Medicine at Mount Sinai; **Julie Segre**, National Institutes of Health; **Claire Wang**, Columbia University; and **Lori Freedman**, University of California, San Francisco. For the complete member list, see page 87.

First International NAM Fellowship Program



NAM President Victor J. Dzau speaks at the International Health Policy Fellowship Launch Ceremony and Public Lecture at the Chinese University of Hong Kong.

The NAM's Health Policy Fellowships and Leadership Programs are among the Nation's most prestigious programs designed to provide exceptional mid- and early-career individuals with a structured experience to develop the skills necessary to catalyze change by participating in the policy process.

In 2018, the NAM will launch the first International Health Policy Fellowship. This program aims to nurture global health policy scholars in the fields of bioethics, medical ethics and law, economics and health policy, and health care. Fellows participate in the convening activities and studies of the National Academies of Science, Engineering, and Medicine to learn how to use such activities to improve domestic and global health and health care. One of the program's initial fellowships will focus on bioethics and include a fellow from The Chinese University of Hong Kong.

This new international fellowship joins the NAM's four existing health policy fellowships and leadership programs:

1. **Robert Wood Johnson Foundation Health Policy Fellows**
2. **NAM Fellowship**
3. **FDA Tobacco Regulatory Science Fellowship**
4. **Distinguished Nurse Scholar-in-Residence**

Collectively, these programs ensure a pipeline of health policy scholars to put forth informed solutions to some of the world's most critical health challenges. For a complete list of current fellows, see pages 86-87. Learn more at nam.edu/fellowships.

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Member Spotlight



The NAM has approximately 2,100 members selected in recognition of distinguished professional achievement and the commitment to protecting and advancing health through volunteer service in the activities of the NAM and other groups in the Academies. Each year, NAM members elect 70 U.S. members and up to 10 international members to join their ranks from a large pool of exceptional nominees. Election to the NAM reflects the respect and admiration that individuals have earned from their peers in the fields of health and medicine and other related disciplines.

Above: Members of the Class of 2016.

Members Inducted in 2017 (Class of 2016)

Anissa Abi-Dargham, MD,
Stony Brook University and
Columbia University

Anita Allen, JD, PhD,
University of Pennsylvania

Maria Jose Alonso,
PharmD, PhD, University
of Santiago de Compostela,
Spain

Masayuki Amagai, MD,
PhD, Keio University School
of Medicine and RIKEN
Center for Integrative Medical
Sciences, Japan

Cheryl Ann Marie
Anderson, PhD, MPH, MS,
University of California, San
Diego

Peter Brian Bach, MD,
MAPP, Memorial Sloan
Kettering Cancer Center

Bonnie L. Bassler, PhD,
Howard Hughes Medical
Institute and Princeton
University

Andrew William Bazemore,
MD, MPH, Robert Graham
Center for Policy Studies in
Family Medicine and Primary
Care

Per-Olof Berggren, PhD,
Karolinska Institute, Sweden

Karen Faith Berman, MD,
National Institute of Mental
Health Intramural Research
Program, National Institutes
of Health

Stefano Bertozzi, MD,
PhD, University of California,
Berkeley

Leslie Glenn Biesecker,
MD, National Human
Genome Research Institute,
National Institutes of Health

Agnes Binagwaho, MD,
PhD, Harvard Medical School

Antonello Bonci, MD,
National Institute on Drug
Abuse, National Institutes of
Health

Malcolm K. Brenner, MA,
MB, BChir, PhD, FRCP,
FRCPath, Baylor College of
Medicine

L.D. Britt, MD, MPH, Eastern
Virginia Medical School

Deborah Watkins Bruner,
RN, PhD, FAAN, Emory
University and Fox Chase
Cancer Center

Robert M. Califf, MD, Duke
University

Alicia Laura Carriquiry,
PhD, Iowa State University

Laura L. Carstensen, PhD,
Stanford University

Andrea L. Cheville, MD,
MSCE, Mayo Clinic

Anne Louise Coleman, MD,
PhD, University of California,
Los Angeles

Kathleen Loretta Collins,
MD, PhD, University of
Michigan

Roger D. Cone, PhD,
University of Michigan

Martha A.Q. Curley, RN,
PhD, FAAN, University of
Pennsylvania

Joseph L. DeRisi, PhD,
University of California,
San Francisco, and Chan
Zuckerberg Biohub

Francis J. Doyle III, PhD,
Harvard University

Karen M. Emmons, PhD,
Harvard T.H. Chan School of
Public Health

Elissa Sarah Epel, PhD,
University of California, San
Francisco

Timothy G. Evans, DPhil,
MD, World Bank Group

Carol Friedman, PhD,
FACMI, Columbia University

Christopher Garcia, PhD,
Howard Hughes Medical
Institute and Stanford
University School of Medicine

Patricia J. Garcia, MD, MPH,
PhD, Minister of Health for
Peru

Carmen García-Peña, MD,
MSc, PhD, National Institute
of Geriatrics, Mexico

Martin Gaynor, PhD,
Carnegie Mellon University

Maura Lianne Gillison, MD,
PhD, Ohio State University

Alison M. Goate, DPhil,
Icahn School of Medicine at
Mount Sinai

Sarah Jane Halton, BA
(Hons), University of
Canberra, Australia

Paula Therese Hammond,
PhD, Massachusetts Institute
of Technology

Stanley L. Hazen, MD, PhD,
Cleveland Clinic

Mukesh K. Jain, MD, Case
Western Reserve University

Maria Jasin, PhD, Memorial
Sloan Kettering Cancer Center

Prabhat Jha, OC, MD, DPhil,
FCAHS, University of Toronto,
Canada

Jeffrey P. Kahn, PhD, MPH,
Johns Hopkins University

Melina Rae Kibbe, MD,
University of North Carolina,
Chapel Hill

Allan Douglas Kirk, MD,
PhD, FACS, Duke University

Mark A. Krasnow, MD,
PhD, Howard Hughes
Medical Institute and Stanford
University School of Medicine

Francis S. Lee, MD, PhD,
Weill Cornell Medicine

Jake Liang, MD, National
Institute of Diabetes and
Digestive and Kidney
Diseases, National Institutes
of Health

Maureen Lichtveld, MD,
MPH, Tulane University
School of Public Health and
Tropical Medicine

George A. Macones, MD,
MSCE, Washington University
School of Medicine, St. Louis

Kelsey Catherine Martin,
MD, PhD, University of
California, Los Angeles

Donald P. McDonnell, PhD,
Duke University School of
Medicine

Bruce L. Miller, MD,
University of California, San
Francisco

Samir Mitragotri, PhD,
University of California, Santa
Barbara

Valerie Montgomery Rice,
MD, Morehouse School of
Medicine

John H. Morrison, PhD,
University of California, Davis

Mark A. Musen, MD, PhD,
Stanford University School of
Medicine

K.M. Venkat Narayan, MD,
MSc, MBA, Emory University

Kenneth Offit, MD, MPH,
Memorial Sloan Kettering
Cancer Center

James Marc Perrin, MD,
FAAP, Harvard Medical
School

Bernice A. Pescosolido,
PhD, Indiana University

Thomas A. Rando, MD,
PhD, Stanford University
School of Medicine

Lynne Doreen Richardson,
MD, Icahn School of Medicine
at Mount Sinai

James A. Roth, DVM,
PhD, College of Veterinary
Medicine, Iowa State
University

Paul Bennett Rothman,
MD, Johns Hopkins University
and Johns Hopkins Medicine

James F. Sallis Jr., PhD,
University of California, San
Diego

Jane E. Salmon, MD, Weill
Cornell Medicine and Hospital
for Special Surgery

Aziz Sancar, M.D., PhD,
University of North Carolina,
Chapel Hill

Tadatsugu Taniguchi,
PhD, University of Tokyo
and Max Planck-University of
Tokyo Center for Integrative
Inflammation, Japan

Hugh Smith Taylor, MD,
Yale School of Medicine

Oyewale Tomori, DVM,
PhD, Redeemer's University,
Nigeria

Craig Venter, PhD, J. Craig
Venter Institute and Human
Longevity Inc.

Cheryl Lyn Walker, PhD,
Baylor College of Medicine

David Walt, PhD, Tufts
University

Huntington Faxon Willard,
PhD, Howard Hughes Medical
Institute, Marine Biological
Laboratory, and University of
Chicago

Michelle A. Williams, ScD,
Harvard T.H. Chan School of
Public Health

Xiaoliang Sunney Xie, PhD,
Harvard University

Clyde W. Yancy, MD,
Northwestern University

Michael Jerome Yaszemski,
MD, PhD, Mayo Clinic

Scenes from the Class of 2016 Induction Ceremony



Xiaoliang Sunney Xie, Mallinckrodt Professor of Chemistry and Chemical Biology at Harvard University, and guests.



Venkat Narayan, Director of the Emory Global Diabetes Research Center and professor at Emory University, and guests.



Cheryl Lyn Walker, Director of the Center for Precision Environmental Health and professor at Baylor College of Medicine, and guest.



L. D. Britt, Henry Ford Professor and Edward J. Brickhouse Chair, Department of Surgery, Eastern Virginia Medical School, and guests.



Congratulations to the Class of 2016!

**Affiliations accurate as of election date.*



Agnes Binagwaho, former Minister of Health of Rwanda, receives her certificate of membership from NAM president **Victor J. Dzau**.

Members Elected in 2017 (Class of 2017)

Mark E. Anderson, MD, PhD, Johns Hopkins University School of Medicine

Scott Allen Armstrong, MD, PhD, Dana-Farber Cancer Institute, Boston Children's Hospital, and Harvard Medical School

Amy F.T. Arnsten, PhD, Yale University School of Medicine

Cornelia Isabella Bargmann, PhD, The Rockefeller University and Chan Zuckerberg Initiative

Mary T. Bassett, MD, MPH, New York City Department of Health and Mental Hygiene

Samuel Frank Berkovic, MD, University of Melbourne (Austin Health), Australia

Christopher N. Bowman, PhD, School of Dental Medicine, University of Colorado

Elizabeth H. Bradley, PhD, Vassar College

Robert F. Breiman, PhD, Emory University

Melinda Beeuwkes Buntin, PhD, Vanderbilt University School of Medicine

Carrie Lynn Byington, MD, Texas A&M University

Neil Calman, MD, MMS, Icahn School of Medicine at Mount Sinai

Xuetao Cao, MD, PhD, Chinese Academy of Medical Sciences and Peking Union Medical College, China

Anne Case, PhD, Princeton University

Arup K. Chakraborty, PhD, Massachusetts Institute of Technology

Howard Y. Chang, MD, PhD, Stanford University School of Medicine

Wendy Webber Chapman, PhD, University of Utah

Tina L. Cheng, MD, MPH, Johns Hopkins University and The Johns Hopkins Hospital

Marshall H. Chin, MD, MPH, University of Chicago

Lewis A. Chodosh, MD, PhD, Abramson Cancer Center and University of Pennsylvania

Christos Coutifaris, MD, PhD, University of Pennsylvania

Benjamin F. Cravatt, PhD, The Scripps Research Institute

Mark Joseph Daly, PhD, Massachusetts General Hospital

Alan D. D'Andrea, MD, Dana-Farber Cancer Institute and Harvard Medical School

Richard J. Davidson, PhD, University of Wisconsin, Madison

Joshua C. Denny, MD, MS, FACMI, Vanderbilt University Medical Center

Karen B. DeSalvo, MD, MPH, MSc, U.S. Department of Health and Human Services

Sharon M. Donovan, PhD, RD, University of Illinois, Urbana-Champaign

Mark R. Dybul, MD, Georgetown University Medical Center

Evan E. Eichler, PhD, University of Washington School of Medicine and Howard Hughes Medical Institute

Serpil Erzurum, MD, Cleveland Clinic

Jeremy James Farrar, MBBS, DPhil, Wellcome Trust, United Kingdom

Alain Fischer MD, PhD, Collège de France and Hôpital Necker-Enfants Malades, France

Mona N. Fouad, MD, MPH, University of Alabama at Birmingham

Gerard E. Francisco, MD, University of Texas System, NeuroRecovery Research Center, and TIRR Memorial Hermann Hospital

Rebekah Gee, MD, MPH, FACOG, State of Louisiana

Christine Grady, RN, PhD, National Institutes of Health

Rachel Green, PhD, Johns Hopkins University School of Medicine

Michael Eldon Greenberg, PhD, Harvard Medical School

Felicia Hill-Briggs, PhD, ABPP, Johns Hopkins University School of Medicine and Johns Hopkins HealthCare

Chanita A. Hughes Halbert, PhD, Medical University of South Carolina

**Affiliations accurate as of election date.*

Scott J. Hultgren, PhD,
Washington University School
of Medicine

Yasmin L. Hurd, PhD, Icahn
School of Medicine at Mount
Sinai

**Nicholas Patrick Jewell,
PhD,** University of California,
Berkeley

**V. Craig Jordan, OBE, PhD,
DSc, FMedSci, FAACR,**
University of Texas M.D.
Anderson Cancer Center

Eve A. Kerr, MD, MPH,
University of Michigan and VA
Ann Arbor Healthcare System

George F. Koob, PhD,
National Institute on Alcohol
Abuse and Alcoholism

**Gabriel P. Krestin, MD,
PhD,** Erasmus MC, University
Medical Center, Netherlands

Paul P. Lee, MD, JD,
University of Michigan Medical
School

Allan I. Levey, MD, PhD,
Emory University

Charles M. Lieber, PhD,
Harvard University

Daniel H. Lowenstein, MD,
University of California, San
Francisco

**Lynne Elizabeth Maquat,
PhD,** University of Rochester

Gerald E. Markowitz, PhD,
City University of New York

John R. Mascola, MD,
National Institute of Allergy
and Infectious Diseases

**Bongani M. Mayosi,
BMedSci, MB, ChB, DPhil,**
University of Cape Town,
South Africa

Tirin Moore, PhD, Stanford
School of Medicine

**Robin Purdy Newhouse,
PhD, RN, FAAN,** Indiana
University School of Nursing

M. Kariuki Njenga, PhD,
Washington State University

**Olugbenga Ogedegbe,
MD, MS, MPH,** New York
University

Rebecca Onie, JD,
Health Leads

**Maria A. Oquendo,
MD, PhD,** University of
Pennsylvania

Michael S. Parmacek, MD,
University of Pennsylvania

**Ramon E. Parsons, MD,
PhD,** Icahn School of
Medicine at Mount Sinai

**Scott Loren Pomeroy,
MD, PhD,** Harvard Medical
School and Boston Children's
Hospital

Martin Pomper, MD, PhD,
Johns Hopkins University
School of Medicine

Rita F. Redberg, MD, MSc,
University of California, San
Francisco

**Lesley Regan, MD, DSc,
FRCOG,** Royal College
of Obstetricians and
Gynaecologists and St Mary's
Hospital, Imperial College
London, United Kingdom

**Therese S. Richmond, PhD,
CRNP, FAAN,** University of
Pennsylvania

Dorothy E. Roberts, JD,
University of Pennsylvania

**John H. Sampson, MD, PhD,
MHSc, MBA,** Duke University
Medical Center

**Robert F. Siliciano,
MD, PhD,** Johns Hopkins
University School of Medicine

Leif I. Solberg, MD,
HealthPartners Institute

**Soumya Swaminathan,
MD,** Indian Council of Medical
Research, India

Viviane Tabar, MD,
Memorial Sloan Kettering
Cancer Center

**Masayo Takahashi, MD,
PhD,** RIKEN Center for
Developmental Biology, Japan

Suzanne L. Topalian, MD,
Johns Hopkins University
School of Medicine

**Nicholas John White,
KCMG, OBE, DSc, MD,
FRCP, FMedSci, FBPhS, FRS,**
Mahidol University, Thailand

**Flaura Koplin Winston, MD,
PhD,** The Children's Hospital
of Philadelphia and University
of Pennsylvania

Donald M. Yealy, MD,
University of Pittsburgh

2017 Annual Meeting



Above: **Gil Omenn** of the University of Michigan introduces the 2017 Scientific Program. Right: **Cori Bargmann** of The Rockefeller University and the Chan Zuckerberg Initiative delivers the keynote address.

The public scientific program of the 2017 NAM Annual meeting was titled **“Developmental Neurosciences: Do We Know Enough to Prevent or Reverse Major Behavioral Disorders?”** Cori Bargmann of the Rockefeller University and the Chan Zuckerberg Initiative delivered a keynote address on “Genes, Brains, and Flexible Behaviors: Themes and Variations from Simple Animals and Humans.” Three scientific panels followed on brain plasticity and its disorders; vulnerability and resilience; and reward mechanisms, risk-taking behavior, and drivers of addiction.

The meeting closed with the annual President’s Forum, which focused this year on the U.S. opioid epidemic. NAM president Victor J. Dzau led a dynamic and illuminating discussion among VADM Jerome M. Adams, U.S. Surgeon General; The Honorable Charles

D. Baker, Governor of Massachusetts; Scott Gottlieb, Commissioner of the U.S. Food and Drug Administration; Judge Steve Leifman, Associate Administrative Judge of the Miami-Dade County Court; and The Honorable Kathleen Sebelius, Former Secretary of the U.S. Department of Health and Human Services.

The NAM is grateful to the 2017 scientific program planning committee: **Gil Omenn** (*Chair*), University of Michigan; **Nancy Adler**, University of California (UCSF), San Francisco; **W. Thomas Boyce**, UCSF, **Elaine Fuchs**, The Rockefeller University; **Steve Hyman**, Broad Institute; and **Carla Shatz**, Stanford University.

The 2018 Annual Meeting will take place October 13-15 in Washington, DC. The public scientific program is titled **“Cancers: Can We Beat the Odds?”** Registration for members opens in May 2018.

2017 Richard & Hinda Rosenthal Symposium

“Pain and the Opioid Epidemic: A Path Forward”



The 2017 Richard & Hinda Rosenthal Symposium was co-hosted by the University of Michigan in Ann Arbor and focused on the critical issue of pain and the opioid epidemic. The symposium featured a keynote address by **Allan Basbaum** of the University of California, San Francisco, titled “The Future of Chronic Pain Management: From Non-Opioid Drugs to Antibodies to Cell Transplants.” **Richard Miech, Chad Brummett, Shelly Flagel,** and **John Traynor** of the University of Michigan served as panelists.

Speakers and panelists reviewed how we can use epidemiological, clinical, and basic science information about the biology of pain

and addiction to stem the opioid epidemic—reflecting on what can be done now and what can be done moving forward. A recording of the keynote and following panel discussion is available at nam.edu/Rosenthal2017.

Since 2016, the Rosenthal Symposium has been hosted outside Washington, DC, and held in conjunction with a regional member meeting. The NAM thanks Michigan-area members for their attendance and contribution to an important conversation.

This annual event is made possible through the generosity of the Richard & Hinda Rosenthal Foundation.

Image credit: Harrygouvas

In Memoriam

The National Academy of Medicine honors the members we have lost between January 1, 2017, and April 30, 2018.

Faye G. Abdellah, Ed.D., Sc.D., R.N.
Bobby R. Alford, M.D.
Kenneth J. Arrow, Ph.D.
Ben A. Barres, M.D., Ph.D.
Gunter Blobel, M.D., Ph.D.
Paul C. Brucker, M.D.
John H. Bryant, M.D.
William T. Butler, M.D.
Richard Daniel Clover, M.D.
Ezra C. Davidson, Jr., M.D.
Andrew D. Dixon, M.D.S., D.Sc., Ph.D., F.A.S.
Jack Elinson, Ph.D.
Daniel D. Federman, M.D.
Daniel W. Foster, M.D.
Walter Guralnick, D.M.D.
Robert J. Haggerty, M.D.
Beatrix A. Hamburg, M.D.
Nathan Hershey, LL.B.
Eugene A. Hildreth, M.D.
Jimmie C. Holland, M.D.

Richard J. Kitz, M.D.
Claude B. Klee, M.D.
Barbara M. Korsch, M.D.
David E. Kuhl, M.D.
Gerhard Levy, Pharm.D.
Richard A. Merrill, LL.B.
Arno G. Motulsky, M.D.
Herbert L. Needleman, M.D.
Ruth S. Nussenzweig, M.D., Ph.D.
Uwe E. Reinhardt, Ph.D.
Dorothy P. Rice
Lewis P. Rowland, M.D.
Murray B. Sachs, Ph.D.
Donald W. Seldin, M.D.
Robert L. Sinsheimer, Ph.D.
Pamela Sklar, M.D., Ph.D.
Richard A. Smith, M.D., M.P.H.
Oliver Smithies, D.Phil.
Thomas E. Starzl, M.D., Ph.D.
Paul D. Stolley, M.D., M.P.H.

Awards



Gustav O. Lienhard Award for Advancement of Health Care

The 2017 Lienhard Award was presented to **Diane Meier** of the Icahn School of Medicine at Mount Sinai. As a geriatrician, Meier found that modern medicine's focus on curing disease and prolonging life ignored crucial elements of patients' and families' distress, including pain, depression, anxiety, sleeplessness, and other symptoms. First at Mount Sinai, and then through the Center to Advance Palliative Care, Meier defined the components of palliative care and clarified its impact on the well-being of patients and families.

To help promote the advancement of quality palliative care, Meier established the Hertzberg Palliative Care Institute at Mount Sinai. As a clinician, she published widely on palliative care in major medical journals, developed guidelines and national quality standards for the field, and educated the general public about the need for palliative care through the media. Her efforts have spurred impressive growth in the nation's palliative care capacity;

there are now over 1,800 programs in the U.S. dedicated to this type of care, and more than 80 percent of people in U.S. hospitals have access to palliative care teams.

Given annually, the award recognizes outstanding national achievement in improving personal health care in the United States. Nominees are eligible for consideration without regard to education or profession, and award recipients are selected by a committee of experts convened by the Academy. This year's selection committee was chaired by **Regina Benjamin**, [NOLA.com/Times Picayune](http://NOLA.com/TimesPicayune) Endowed Chair in Public Health Sciences at Xavier University of Louisiana.

The Lienhard Award is funded by an endowment from the Robert Wood Johnson Foundation. Gustav O. Lienhard was chair of the foundation's board of trustees from the organization's establishment in 1971 to his retirement in 1986—a period in which the foundation moved to the forefront of American philanthropy in health care.



Rhoda and Bernard Sarnat International Prize in Mental Health

The 2017 Sarnat Prize was awarded to **Joseph Coyle**, whose research laid the foundation for integrating neuroscience and clinical psychiatry and shifted psychiatry's emphasis toward empirically based brain research; and to the team of **Catherine Lord** and **Matthew State**, whose work revolutionized the study of autism and related neuropsychiatric disorders.

Since 1992, the Sarnat Prize has been presented to individuals, groups, or organizations that have demonstrated outstanding achievement in improving mental health. The prize recognizes — without regard for professional discipline or nationality — achievements in basic science, clinical application, and public policy that lead to progress in the understanding, etiology, prevention, treatment, or cure of mental disorders, or to the promotion of mental health. As defined by the nominating criteria, the field of mental health encompasses neuroscience, psychology, social work, nursing, psychiatry, and advocacy.

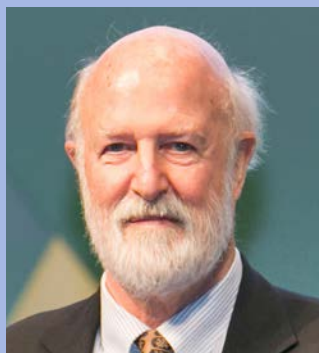
The award is supported by an endowment created by Rhoda and Bernard Sarnat of Los Angeles. Rhoda Sarnat is a licensed clinical social worker, and Bernard Sarnat is a plastic and reconstructive surgeon and researcher. The Sarnats' concern about the destructive effects of mental illness inspired them to establish the award. Nominations for potential recipients are solicited from Academy members, deans of medical schools, and mental health professionals. The 2017 selection committee was chaired by **Huda Akil**, Gardner Quarten Distinguished University Professor of Neuroscience and Psychiatry and co-director, The Molecular & Behavioral Neuroscience Institute, University of Michigan.

Member Awards

Every year, NAM members vote to recognize three of their peers for exceptional service to the NAM and the National Academies.



The **Walsh McDermott Medal** recognizes an NAM member for distinguished service over an extended period of time. The 2017 award was presented to **Barbara J. McNeil** of Harvard Medical School and Brigham and Women's Hospital. During the past three decades, McNeil has served on the NAM's Governing Council, the National Academies' Nuclear and Radiation Studies Board, the Commission on Behavioral and Social Sciences and Education, the Board on Health Sciences Policy, and the Board on Health Care Services—as well as a wide variety of committee service on subjects ranging from breast cancer detection to airport passenger screening.



The **David Rall Medal** recognizes an NAM member for particularly distinguished leadership as chair of a study committee or other activity, showing commitment above and beyond the usual responsibilities of the position. The 2017 award was presented to **Richard O. Hynes** of Howard Hughes Medical Institute and the Massachusetts Institute of Technology. A unifying force at the National Academies since the mid-1990s, Hynes co-chaired high-profile committees on two politically sensitive topics—embryonic stem cell research and human genome editing—which produced seminal reports that have, or are poised to, shape the parameters of public debate and the policies and regulation of these fields.

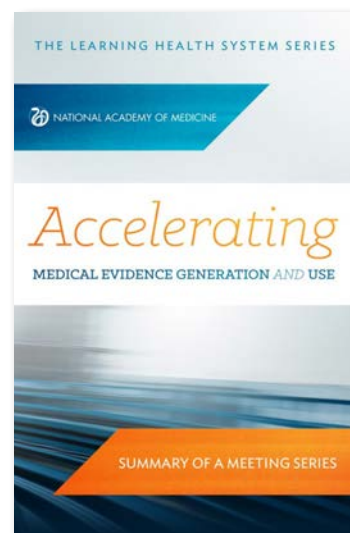
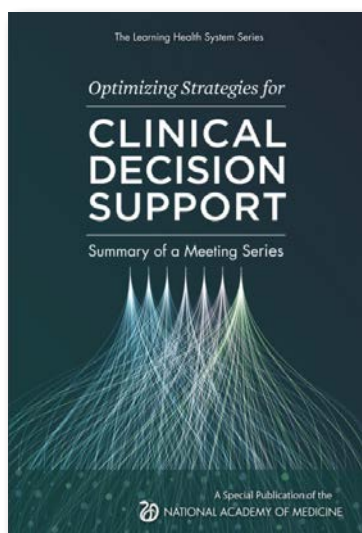
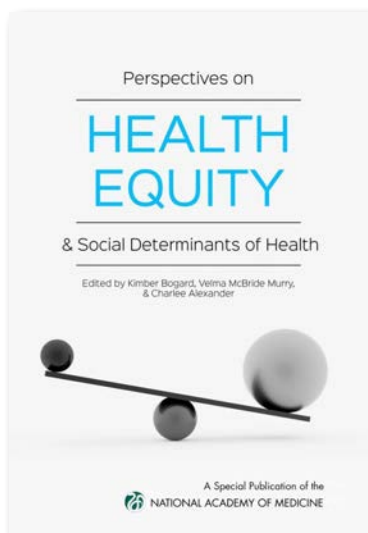
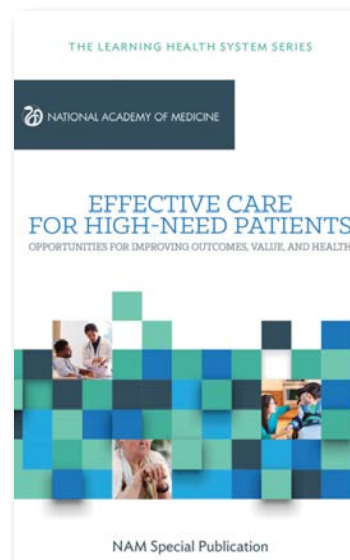
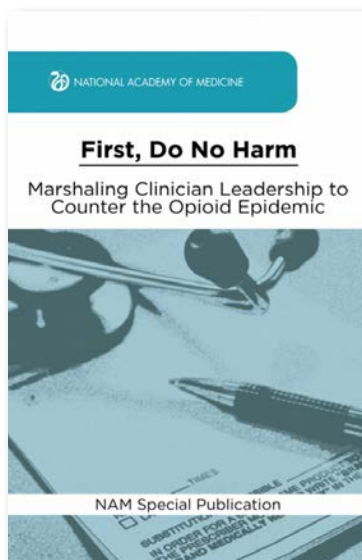
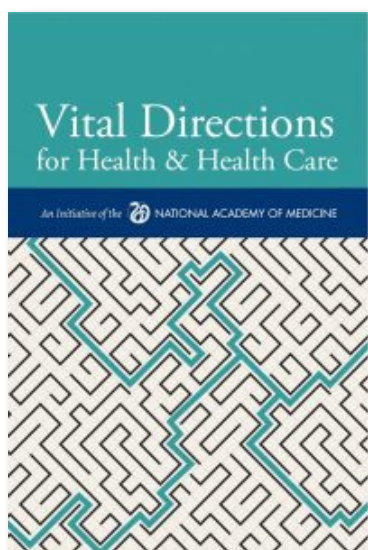


The **Adam Yarmolinsky Medal** recognizes an NAM member from a discipline outside the health and medical sciences who has contributed to the mission of the NAM over a significant period. The 2017 award was presented to **Ruth R. Faden** of Johns Hopkins University. Throughout her career, Faden has changed the role of bioethics in health and medicine by emphasizing the role of public health ethics, tackling novel questions in research ethics, and exploring foundational issues in social justice. She has shared her expertise as a member of many National Academies committees since the late 1980s.

Publications

NAM Special Publications

In 2017, the NAM published six special publications to synthesize findings from NAM initiatives and share the guidance of experts. The following books are available for free download from [NAM.edu](https://nam.edu).



NAM Perspectives

The *Perspectives* platform extends the NAM's convening and advisory functions by providing a venue for leading health, medical, science, and policy experts to reflect on issues and opportunities important to the advancement of health, health care, and biomedical science.

In 2017, the NAM published 50 *Perspectives*. The top 10 most-read papers are listed below. See them all at nam.edu/Perspectives.

1. Burnout Among Health Care Professionals: A Call to Explore and Address This Underrecognized Threat to Safe, High-Quality Care
2. Harnessing Evidence and Experience to Change Culture: A Guiding Framework for Patient and Family Engaged Care
3. Standardized Screening for Health-Related Social Needs in Clinical Settings: The Accountable Health Communities Screening Tool
4. Social Determinants of Health 101 for Health Care: Five Plus Five
5. Ten Attributes of Health Literate Health Care Organizations
6. Manufacturing Cell Therapies: The Paradigm Shift in Health Care of This Century
7. Core Principles & Values of Effective Team-Based Health Care
8. A Multifaceted Systems Approach to Addressing Stress Within Health Professions Education and Beyond
9. The Interplay of Community Trauma, Diet, and Physical Activity
10. Breaking the Culture of Silence on Physician Suicide



NASEM Health and Medicine Publications

The following publications were produced in 2017 by program divisions of the National Academies of Sciences, Engineering, and Medicine.

Accounting for Social Risk Factors in Medicare Payment

Advancing Obesity Solutions Through Investments in the Built Environment*

Application of Systematic Review Methods in an Overall Strategy for Evaluating Low-Dose Toxicity From Endocrine Active Chemicals

Assessment of the Department of Veterans Affairs Airborne Hazards and Open Burn Pit Registry

Biomarkers of Neuroinflammation*

Building a National Capability to Monitor and Assess Medical Countermeasure Use During a Public Health Emergency: Going Beyond the Last Mile*

Building Communication Capacity to Counter Infectious Disease Threats*

Building Sustainable Financing Structures for Population Health: Insights From Non-Health Sectors*

Cancer Care in Low-Resource Areas: Cancer Treatment, Palliative Care, and Survivorship Care*

The Challenge of Treating Obesity and Overweight*

Combating Antimicrobial Resistance: A One Health Approach to a Global Threat*

Communicating Clearly About Medicines*

Communities in Action: Pathways to Health Equity

Community Violence as a Population Health Issue*

Controlled Human Inhalation-Exposure Studies at EPA

Countering Violent Extremism Through Public Health Practice*

Developing a Methodological Research Program for Longitudinal Studies*

Driving Action and Progress on Obesity Prevention and Treatment*

The Drug Development Paradigm in Oncology*

Enabling Precision Medicine: The Role of Genetics in Clinical Drug Development*

Environmental Chemicals, the Human Microbiome, and Health Risk: A Research Strategy

An Evidence Framework for Genetic Testing

Examining Challenges and Possible Strategies to Strengthen U.S. Health Security*

Exploring Equity in Multisector Community Health Partnerships*

Exploring the State of the Science in the Field of Regenerative Medicine: Challenges of and Opportunities for Cellular Therapies*

Exploring the Translation of the Results of Hurricane Sandy Research Grants Into Policy and Operations*

Facilitating Health Communication With Immigrant, Refugee, and Migrant Populations Through the Use of Health Literacy and Community Engagement Strategies*

Guiding Principles for Developing Dietary Reference Intakes Based on Chronic Disease

Health Communication With Immigrants, Refugees, and Migrant Workers*

The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research

Health Insurance and Insights From Health Literacy: Helping Consumers Understand*

Incorporating Weight Management and Physical Activity Throughout the Cancer Care Continuum*

Integrating the Patient and Caregiver Voice Into Serious Illness Care*

Integration of FDA and NIOSH Processes Used to Evaluate Respiratory Protective Devices for Health Care Workers*

Making Medicines Affordable: A National Imperative

Measuring Personal Environmental Exposures*

Models and Strategies to Integrate Palliative Care Principles Into Care for People With Serious Illness*

Multisector Community Health Partnerships: Potential Opportunities and Challenges*

A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report

Navigating the Manufacturing Process and Ensuring the Quality of Regenerative Medicine Therapies*

Nutrition Across the Lifespan for Healthy Aging*

Opportunities for Organ Donor Intervention Research: Saving Lives by Improving the Quality and Quantity of Organs for Transplantation

Optimizing the Process for Establishing the Dietary Guidelines for Americans: The Selection Process

Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use

People Living With Disabilities: Health Equity, Health Disparities, and Health Literacy*

Preparing for a Rapid Response to Major Marine Oil Spills: Protecting and Assessing the Health and Well-Being of Communities*

Preparing for the Future of Disaster Health Volunteerism*

Preventing Cognitive Decline and Dementia: A Way Forward

The Promise of Assistive Technology to Enhance Activity and Work Participation

Protecting the Health and Well-Being of Communities in a Changing Climate*

Real-World Evidence Generation and Evaluation of Therapeutics*

Redesigning the Process for Establishing the Dietary Guidelines for Americans

Review of NASA's Evidence Reports on Human Health Risks: 2016 Letter Report

Review of WIC Food Packages: Improving Balance and Choice—Final Report

Strategies to Limit Sugar-Sweetened Beverage Consumption in Young Children*

Therapeutic Development in the Absence of Predictive Animal Models of Nervous System Disorders*

Understanding Pathways to Successful Aging: Behavioral and Social Factors Related to Alzheimer's Disease*

Using 21st Century Science to Improve Risk-Related Evaluations

Using Technology to Advance Global Health*

* = *Proceedings of a Workshop*

Featured NASEM Consensus Reports

Global Health and the Future Role of the United States

The United States has long been a leader in global health. Yet resources are not unlimited, and the case for continued commitment must be made. Against the backdrop of the influential legacy of the United States on the global health stage, the new administration is now faced with the choice of whether or not to ensure that gains in global health—won with billions of U.S. dollars, years of dedication, and strong programs—are sustained and poised for further growth.

With support from a broad array of federal agencies, foundations, and private partners, the National Academies of Sciences, Engineering, and Medicine convened an

ad hoc committee to identify global health priorities in light of current and emerging global health threats and challenges. In the resulting report, ***Global Health and the Future Role of the United States***, the committee provides recommendations to the U.S. government and other stakeholders for increasing responsiveness, coordination, and efficiency in addressing these threats and challenges by establishing priorities and mobilizing resources.

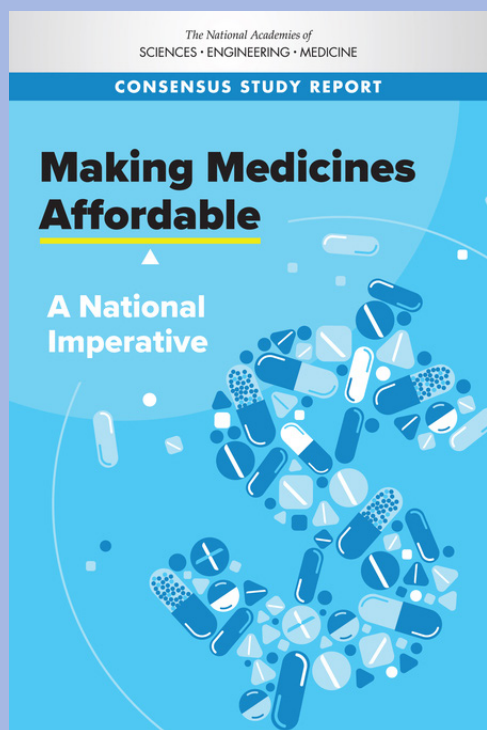
Most foreign assistance—especially when directed toward health—is an investment in the health of the recipient country, the United States, and the world at large. U.S. motivation is two-pronged: to secure protection against global health threats, and to promote productivity and economic growth in other countries.

While the burden of infectious diseases rests predominantly with low-income countries, these diseases represent global threats that could have dire consequences for any country, including the United States, in both human and economic costs. The increasing prevalence of noncommunicable diseases (NCDs) has also negatively affected global economies, threatening societal gains in life expectancy, productivity, and overall quality of life.

Healthy populations are important on multiple levels. Investing in human capital contributes significantly to economic growth, prosperity, and stability in countries and creates more reliable and durable partners in the world. Download the complete report for free at nationalacademies.org/USGlobalHealth.



Making Medicines Affordable: A National Imperative



Over the past several decades, the U.S. biopharmaceutical sector has been very successful in developing and delivering effective drugs for improving health and fighting disease. Many medical conditions that were long deemed untreatable can now be cured or managed effectively. Yet this success has come at a cost: Spending on prescription drugs has been rising dramatically, to the point that many people have difficulty paying for the drugs that they or their family members need. Drug costs are a significant part of the nation's total spending on health care.

With support from a host of sponsors, the National Academies of Sciences, Engineering, and Medicine conducted a study

to recommend policy actions that address drug price trends, improve patient access to affordable and effective treatments, and encourage innovations that address significant needs in health care. The resulting report, ***Making Medicines Affordable: A National Imperative***, provides several strategies to tackle the rising costs of prescription drugs without discouraging the development of new and more effective drugs for the future.

The challenge is formidable. There may be trade-offs between current drug affordability and new drug availability. Controlling drug costs too rigidly, for example, could potentially reduce the expected profits of drug companies, which could alter their decisions regarding major investments to develop new drugs. Furthermore, the complexity of the medical system—which includes patients, clinicians, hospitals, insurance companies, drug companies, pharmacists, pharmacy benefit managers, various government agencies, advocacy organizations, and many others—makes it very difficult to predict the precise effects of any specific policy change. This challenge is magnified by the lack of transparency concerning the financial transactions between the various participants in the biopharmaceutical supply chain.

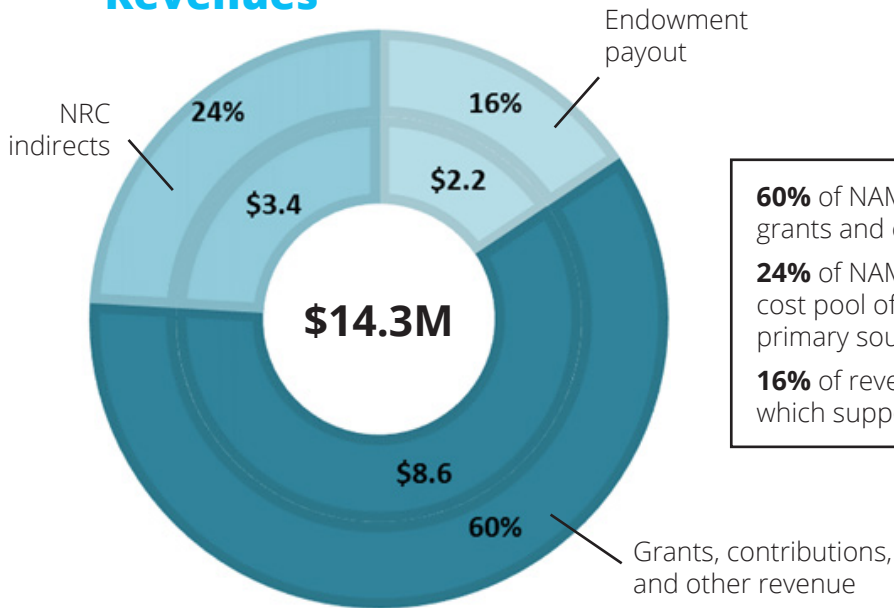
Nonetheless, there are a number of measures that can and should be taken to improve the affordability of prescription drugs for patients in the United States.

Download the report for free at nationalacademies.org/NASEMAffordableDrugs.

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Finances

Revenues



60% of NAM revenues in 2017 were from grants and contributions by external donors

24% of NAM revenues are from the indirect cost pool of the National Research Council, the primary source of funds supporting operations

16% of revenue is from endowment payout, which supports both operations and programs

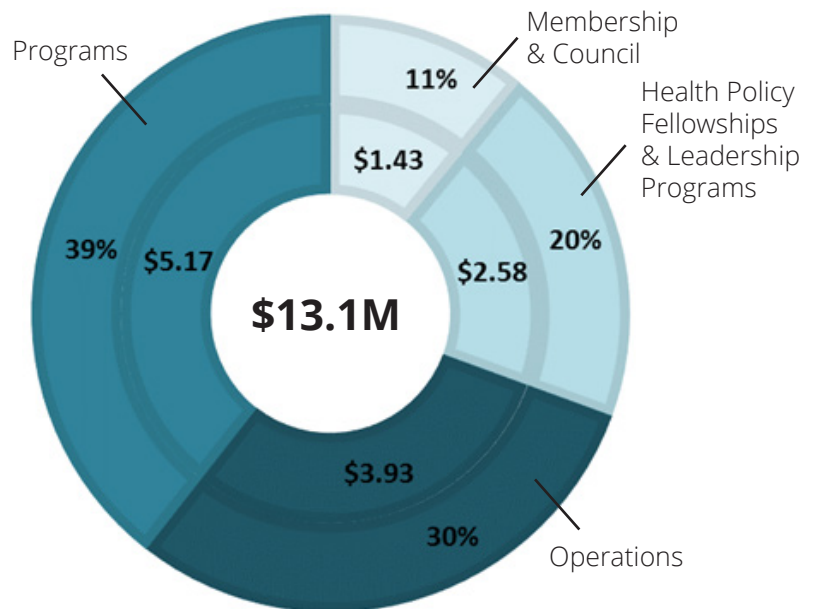
Expenses

59% of expenses support program activities

30% of expenses support general operations, including the President's and Executive Offices, Development, Foreign Secretary, and Home Secretary

11% of expenses support membership and NAM Council activities

35 total NAM staff at the close of the fiscal year; **2** additional positions under recruitment



The NAM budget supports two main areas of activity—general operations (reflected in the chart above as “Operations” and “Membership and Council”) and program activities (reflected in the chart above as “Programs” and “Health Policy Fellowships and Leadership Programs”). General operations includes Executive Office activities as well as development, communications, finance, program development, NAM Council and membership services, and a portion of joint National Academies expense. “Programs” includes the Leadership Consortium for a Value and Science-Driven Health System, as well as Culture of Health, Clinician Well-Being, and Vital Directions. Health Policy Fellowships and Leadership Programs is a distinct program and is reflected separately in the chart above.

Donor Recognition

We are deeply grateful for the generous support received from the many members, friends, staff, and philanthropic organizations that supported the National Academy of Medicine during 2017. More than **\$10.6 million** was raised from private sources to help the NAM lead, innovate, and impact the future of health and health care. The scope and impact of these gifts and grants are significant. Highlights from the year are:

- NAM members and friends contributed **\$532,868** to the Annual Fund. The NAM member participation rate for all giving increased to **29%**.
- The NAM Giving Society welcomed **12** new NAM members in acknowledgment of cumulative giving of at least **\$20,000**: Frances H. Arnold, David Baltimore, Graham A. Colditz, Larry A. Green, Diane E. Griffin, Leroy E. Hood, Edward A. Kravitz, Ruth W. Lubic, Stephen R. Quake, Charles J. Sherr, Harold E. Varmus, and Thomas E. Wellems.
- The Healthy Longevity Grand Challenge received more than **\$4.5 million** in support from Valerie and John W. Rowe, United Therapeutics, and Joon Yun and Kimberly Bazar. The Grand Challenge will address the demographic shift of our aging population by catalyzing innovation, funding breakthrough research, and identifying solutions and directions to optimize the health, function, and well-being of all people in later life.
- The NAM raised **\$1.5 million** to support a consensus study as part of the Culture of Health Program. The study will examine the neurobiological and sociobehavioral science of adolescent development, health, well-being, and resilience. Grants were received from the Bezos Family Foundation, The Robert Wood Johnson Foundation, the National Public Education Support Fund, and the Seattle Foundation.
- The Lanson Foundation provided a **\$600,000** grant to launch an international health policy fellowship program at the NAM. The fellowship will begin in 2018 with the first fellow from the Chinese University of Hong Kong.
- A consortium of medical academies, associations, and other organizations contributed **\$982,500** to support the Action Collaborative on Clinician Well-Being and Resilience.
- The Robert Wood Johnson Foundation continues to partner with the NAM to offer fellowships in health policy. Grants totaling **\$949,860** were received from the Foundation in support of the fellowship program in 2017.

Philanthropic gifts and grants make it possible for the NAM to fulfill its mission. We greatly appreciate all of the support received from our many members and friends.

Lifetime Giving

We gratefully acknowledge the support of private contributors to the National Academy of Medicine. The collective, private philanthropy of our members and friends helps to enhance the NAM's mission to lead, inspire innovation, and impact the health of all people.

Einstein Society

In recognition of members and friends who have made lifetime contributions of \$100,000 or more to the National Academy of Sciences, the National Academy of Engineering, or the National Academy of Medicine. We acknowledge contributions made as personal gifts or as gifts facilitated by the donor through a donor-advised fund, matching gift program, or family foundation. Names in bold are NAM members.

\$10 million or more

Arnold and Mabel Beckman*
Bernard M. Gordon
Fred Kavli*
Daniel E. Koshland, Jr.*
George P. Mitchell*
Raymond* and Beverly Sackler
James H. and Marilyn Simons

\$5 million to \$10 million

Donald L. Bren
William R. and Rosemary B. Hewlett*
Peter O'Donnell, Jr.
Fritz J. and Dolores H. Russ Prize Fund of the Russ College of Engineering and Technology at Ohio University
Dame Jillian Sackler

\$1 million to \$5 million

Bruce and Betty Alberts
Richard and Rita **Atkinson**
Norman R. Augustine
Craig and Barbara Barrett
Jordan* and Rhoda Baruch
Stephen D. Bechtel, Jr.
Harry E. Bovay, Jr.*
Harvey V. Fineberg and Mary E. Wilson
Cecil H. Green*
Michael and Sheila Held*
Ming and Eva Hsieh
Irwin and Joan Jacobs
Kenneth A. Jonsson*
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John F. McDonnell
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Gordon and Betty Moore
Philip and Sima **Needleman**
Robert* and Mayari Pritzker
Richard L. and Hinda G. Rosenthal*
Martine A. Rothblatt

Jack W. and Valerie **Rowe** Bernard* and Rhoda Sarnat
Leonard D. Schaeffer
Sara Lee and Axel Schupf
Anthony J. Yun and Kimberly A. Bazar

\$500,000 to \$1 million

Rose-Marie and Jack R.* Anderson
John and Elizabeth Armstrong
Kenneth E. Behring
Gordon Bell
Elkan R.* and Gail F. **Blout**
Carson Family Charitable Trust
Charina Endowment Fund
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James McConnell Clark
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Richard Evans*
Eugene Garfield Foundation
Theodore Geballe
Penny and Bill George, George Family Foundation

William T.* and Catherine Morrison Golden
 Alexander Hollaender*
 Thomas V. Jones*
 Cindy and Jeong Kim
 Ralph and Claire Landau*
 Asta and William W. Lang*
 Ruben F.* and Donna Mettler Dane* and Mary Louise Miller
 Oliver E. and Gerda K. Nelson*
Gilbert S. Omenn and
 Martha A. Darling
 Shela and Kumar Patel
 William J. Rutter
 Herbert A. and Dorothea P. Simon*
 Raymond S. Stata
Roy and Diana **Vagelos**
 Andrew and Erna* Viterbi
 Alan M. Voorhees*
 Anonymous (1)

\$250,000 to \$500,000

The Agouron Institute
W.O. Baker*
 Warren L. Batts
 Elwyn and Jennifer Berlekamp
 Clarence S. Coe*
 W. Dale and Jeanne C. Compton*
 David and Miriam Donoho
Jerome H.* and Barbara N. **Grossman**
 Chad and Ann Holliday
 William R. Jackson*
 Robert L. and Anne K. James
 Mary and Howard* Kehrl
 Robin K. and Rose M. McGuire
 Janet and Richard M.* Morrow
 Ralph S. O'Connor
 Kenneth H. Olsen*
 Ann and Michael Ramage

Simon Ramo*
 Anne and Walt Robb
 Matthew L. Rogers and Swati Mylavarapu
Stephen* and Anne **Ryan**
 Henry and Susan Samuelli
 David E. Shaw
 H.E. Simmons*
 Judy Swanson
 Ted Turner
 Leslie L. Vadasz
 Martha Vaughan
 Charles M.* and Rebecca M. Vest

\$100,000 to \$250,000

Holt Ashley*
 Francisco J. and Hana Ayala
 William F. Ballhaus, Sr.*
 Thomas D.* and Janice H. Barrow
 H.H. and Eleanor F. Barschall*
 Daniel and Frances Berg
 Diane and Norman Bernstein
 Bharati and Murty Bhavaraju
 Chip and Belinda Blankenship
 Erich Bloch*
 Barry W. Boehm
 Arindam Bose
 David G. Bradley
Lewis M. Branscomb
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 George* and Virginia Bugliarello
 Malin Burnham
 Ursula Burns and Lloyd Bean
 John and Assia Cioffi
 Paul Citron and Margaret Carlson Citron
 A. James Clark*
 G. Wayne Clough

Rosie and Stirling A.* Colgate
Barry and Bobbi **Collier**
 John D. Corbett*
 Ross and Stephanie Corotis
 Lance and Susan Davis
Roman W. DeSanctis
 Robert and Florence Deutsch
 Nicholas M. Donofrio
 Paul M. Doty*
 Charles W. Duncan, Jr.
 Ruth and **Victor Dzuu**
 George and Maggie Eads
 Robert and Cornelia Eaton
 James O. Ellis, Jr. and Elisabeth Paté-Cornell
 Dotty and Gordon England
 Emanuel and Peggy Epstein
 Olivia and Peter Farrell
 Michiko So* and Lawrence Finegold
 Tobie and Daniel J.* Fink
 George and Ann Fisher
 Robert C.* and Marilyn G. Forney
 Harold K.* and Betty Forsen
 William L. and Mary Kay Friend
 Christopher Galvin
 William H. and Melinda F. Gates III
 Nan and Chuck Geschke
 Jack and Linda Gill
 Martin E. and Lucinda Glicksman
 George and Christine Gloeckler
 Christa and Detlef Gloge
Avram Goldstein*
 Robert W. Gore
 Paul and Judy Gray
 Corbin Gwaltney
 John O. Hallquist

Margaret A. Hamburg and

Peter F. Brown

William M. Haney III

George and Daphne

Hatsopoulos

John L. Hennessy

Jane Hirsh

Michael W. Hunkapiller

M. Blakeman Ingle

Richard B. Johnston, Jr.

Anita K. Jones

Trevor O. Jones

Thomas Kailath

Yuet Wai and Alvera **Kan**

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Jill Howell Kramer

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Janet and Barry Lang

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Gerald and Doris **Laubach**

David M.* and Natalie

Lederman

Bonnie Berger and Frank

Thomson Leighton

Frances and George Ligler

Whitney and Betty MacMillan

Asad M., Gowhartaj, and Jamal

Madni

Davis L. Masten and

Christopher Ireland

Roger L. McCarthy

William W. McGuire

Burt and Deedee McMurtry

G. William* and Ariadna Miller

Ronald D. Miller

Stanley L. Miller*

Sanjit K. and Nandita Mitra

Joe and Glenna Moore

David* and Lindsay

Morgenthaler

Clayton Daniel and Patricia L.

Mote

Jaya and Venky Narayanamurti

Ellen and Philip Neches

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Charles and Doris Pankow*

Larry* and Carol Papay

Jack S. Parker*

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Henry M. Rowan*

Joseph E. and Anne P. Rowe*

Jonathan J. Rubinstein

Maxine L. Savitz

Walter Schlup*

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David E. Shaw

Richard P. Simmons

Robert F. and Lee S. Sproull

Georges C. St. Laurent, Jr.

Arnold and Constance Stancell

Richard J. and Bobby Ann

Stegemeier

Edward C. Stone

John and Janet Swanson

Charlotte and Morris

Tanenbaum

Peter and Vivian Teets

James M. Tien and Ellen S.

Weston

Gary and Diane Tooker

James J. Truchard

John C. Wall

Robert and Joan Wertheim

Robert M.* and Mavis E. White

John C. Whitehead*

Jean D. Wilson

Wm. A. Wulf

Ken Xie

Tachi and Leslie **Yamada**

Adrian Zaccaria

Alejandro Zaffaroni*

Janet and Jerry Zucker

Anonymous (2)

NAM Society

In recognition of members and friends of the NAM who have made lifetime contributions totaling \$20,000 to \$100,000. We acknowledge contributions made as personal gifts or as gifts facilitated by the donor through a donor advised fund, matching gift program, or family foundation. Names in bold font are NAM members.

\$75,000 to \$100,000

David Baltimore

John K. Castle

Michael and Pat **McGinnis**

Rudi* and Sonja **Schmid**

\$50,000 to \$75,000

John R. Ball

Jacqueline K. Barton and

Peter B. Dervan

Stuart Bondurant and

Susan Ehringhaus

Purnell W. Choppin

William H. Danforth

The Eleftheria Foundation

Delbert A. and Beverly C.

Fisher

Jane E. Henney and **Robert**

Graham

Woodrow A. Myers, Jr.

Robert M. and Marilyn R.

Nerem

Eric M. Shooter

Maxine F. Singer

Harold C. and Carol H. **Sox**

Samuel O. Thier

Robert E. Tranquada

Gail L. Warden

Torsten N. Wiesel

Ronald A. Williams

Anonymous (2)

\$20,000 to \$50,000

Francois M. Abboud

Nancy Adler and **Arnold**
Milstein

Dyanne D. Affonso

Frances H. Arnold

Jack D. Barchas

Paul Berg

Kenneth I. Berns

Maureen Bisognano

Floyd E. Bloom

Enriqueta C. Bond

Roger J. Bulger

Peggy and **Thomas Caskey**

Christine Cassel and Michael
McCally

David R. and Jacklyn A.

Challoner

Ellen Wright Clayton and Jay
Clayton

Fred E. Cohen and Carolyn B.
Klebanoff

Graham A. Colditz

Mary Sue Coleman

Colleen Conway-Welch

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Jane and **Worth B.* Daniels,**
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In Memory of **James P. Hughes**—James M. Hughes
In Memory of **Clifford Keene**—Walter and Marti Unger
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In Memory of **Theresa Manson**—JoAnn E. Manson
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In Honor of **Donald Trump**—Kristina Novick
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In Honor of **The defense of evidence and science in troubled times**—
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Lifetime

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Complete Program Listing

Action Collaborative on Clinician Well-Being & Resilience

A standing group of over 50 organizations committed to preventing burnout and promoting clinician well-being to ensure high-quality patient care and improve the function of the health system. More information: nam.edu/CW.

Director: **Charlee M. Alexander**
(cmalexander@nas.edu)

Chair: **Victor J. Dzau**, National Academy of Medicine

Vice Chair: **Darrell Kirch**, Association of American Medical Colleges

Vice Chair: **Thomas Nasca**, Accreditation Council for Graduate Medical Education

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Lotte Dyrbye, Mayo Clinic

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Lorna Lynn, American Board of Internal Medicine and the ABIM Foundation

Kenya McRae, American Osteopathic Association

Bernadette Melnyk, Ohio State University

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Edith Mitchell, National Medical Association

Robert Phillips, American Board of Family Medicine

Johnathan Ripp, Collaborative for Healing and Renewal in Medicine

Srijan Sen, University of Michigan

Javeed Sukhera, Western University

Conceptual Model Working Group

Arthur Hengerer (*Co-Lead*), Federation of State Medical Boards

Lois Margaret Nora (*Co-Lead*), American Board of Medical Specialties

Connie Barden, American Association of Critical-Care Nurses

Timothy Brigham, Accreditation Council for Graduate Medical Education

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Sandeep Kishore, Icahn School of Medicine at Mount Sinai

Beverly Malone, National League for Nursing

LaVonne Ortega, Centers for Disease Control and Prevention

Paul Rothman, Johns Hopkins Medicine

Tina Shah

Fan Tait, American Academy of Pediatrics

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External Factors and Workflow Working Group

Pamela Cipriano (*Co-Lead*), American Nurses Association

Cynthia Daisy Smith (*Co-Lead*), American College of Physicians)

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Jessica Fried, Hospital of the University of Pennsylvania

Tejal Gandhi, National Patient Safety Foundation at Institute for Healthcare Improvement

Ron Harter, American Society of Anesthesiologists

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Saul Levin, American Psychiatric Association

Michael Maguire, Jefferson/Christiana Care

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Graham McMahon, Accreditation Council for Continuing Medical Education

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Denice Stewart, American Dental Education Association

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Publications and Art Show Working Group

Sandeep Kishore (*Lead*), Icahn School of Medicine at Mount Sinai

Carol Bernstein, New York University School of Medicine

Jay Bhatt, American Hospital Association

Steve Bird, Society for Academic Emergency Medicine

Tim Brigham, Accreditation Council for Graduate Medical Education

Neil Busis, American Academy of Neurology

Victor Dzau, National Academy of Medicine
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Thomas Nasca, Accreditation Council for Graduate Medical Education

Jonathan Ripp, Collaborative for Healing and Renewal in Medicine

Tina Shah

Javeed Sukhera, Schulich School of Medicine and Dentistry at Western University in London, Ontario, Canada

Deborah Trautman, American Association of Colleges of Nursing

Culture of Health Program

A multiyear collaborative effort to identify strategies to create and sustain conditions that support equitable good health for all Americans. The first five years of the program will produce a series of NASEM consensus studies, as well as public workshops, community events, and tools for stakeholders.

Co-Directors: **Charlee M. Alexander** (cmalexander@nas.edu) and **Ivory Clarke** (iclarke@nas.edu)

Advisory Committee

Hortensia de los Angeles Amaro, University of Southern California

Stuart Butler, Brookings Institution

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Martín Sepulveda, IBM Watson Health

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Antonia Villarruel, University of Pennsylvania School of Nursing

Gail Wilensky, Project Hope

DC Public Health Case Challenge

A local university team competition that promotes interdisciplinary, problem-based learning around a public health issue that faces the Washington, DC, community.

Director: **Amy Geller** (ageller@nas.edu)

Participants from the 2017 DC Public Health Case Challenge prize-winning teams (American University, Georgetown University, George Washington University, and Howard University). The 2017 topic was Lead and Adverse Childhood Experiences: Neurological and Behavioral Consequences for Youth in the District of Columbia



Emerging Leaders Forum

A term membership program for exceptional early- and mid-career health and medicine professionals to learn by embedding in NAM activities and to share their expertise to guide NAM strategic development.

Co-Directors: **Gregg Margolis** (gmargolis@nas.edu) and **Meg McCoy** (mmccoy@nas.edu)

2017-2018 Forum Roster

Deidra C. Crews, Johns Hopkins University School of Medicine

Lori Freedman, University of California, San Francisco

Christopher Friese, University of Michigan School of Nursing

Sandeep Kishore, Icahn School of Medicine at Mount Sinai

Margaret (Gretchen) L. Schwarze, University of Wisconsin

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Kimberly Snyder, Food and Drug Administration Center for Tobacco Products

Sohail Tavazoie, The Rockefeller University

Y. Claire Wang, Columbia University

Joseph C. Wu, Stanford School of Medicine

Ramnik Xavier, Massachusetts General Hospital, Harvard Medical School, and Broad Institute

Healthy Longevity Grand Challenge

A series of inducement prizes, as well as an evidence-based global roadmap report, to catalyze transformative innovation and inform policies and priorities to advance healthy aging worldwide.

Director: **Elizabeth Finkelman** (efinkelman@nas.edu)

Design Committee

Nancy E. Adler, University of California, San Francisco

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Diane E. Griffin, Johns Hopkins Bloomberg School of Public Health

Marc Hodosh, Hodosh Productions

Edward W. Holmes, Sanford Consortium for Regenerative Medicine

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Roderic Pettigrew, Texas A&M University

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John (Jack) Rowe, Columbia University Mailman School of Public Health

Mark Walport, UK Research and Innovation

Tadataka (Tachi) Yamada, Frazier Healthcare Partners

Anthony Joonkyoo “Joon” Yun, Palo Alto Investors, LLC

Health Policy Fellowships and Leadership Programs

Four fellowship programs designed to enrich the experience of early- and mid-career professionals and foster the next generation of health and medical leaders.

Director: **Gregg Margolis** (gmargolis@nas.edu)

Robert Wood Johnson Foundation Health Policy Fellows

The nation's most comprehensive fellowship experience at the nexus of health, science, and policy in Washington, DC.

2017-2018 Fellows

Carrie Colla, The Dartmouth Institute for Health Policy and Clinical Practice

Robin Fleming, University of Washington, Seattle

Caprice Knapp, Pennsylvania State University

Allison Myers, Counter Tools

Karin Rhodes, Northwell Health and Hofstra Northwell School of Medicine

Reginald Tucker-Seeley, University of Southern California

NAM Fellowship

A program is designed for health science scholars who are 1 to 10 years out from completion of a residency or receipt of a doctoral degree to participate in the process by which the National Academies provide health advice to the nation.

2017-2019 Norman F. Gant/American Board of Obstetrics and Gynecology Fellow

Ebony Carter, Washington University School of Medicine

2017-2019 James C. Puffer, M.D./American Board of Family Medicine Fellow

Tammy Chang, University of Michigan School of Medicine

2017-2019 Gilbert S. Omenn Fellow

Ellen Eaton, University of Alabama

2017-2019 American Board of Emergency Medicine Fellow

Mahshid Abir, University of Michigan and RAND Corporation

2017-2019 Greenwall Fellow in Bioethics

Neal Dickert, Emory University and Atlanta VA Medical Center

2016-2018 NAM Fellow in Pharmacy

Jonathan Watanabe, University of California, San Diego

2016-2018 NAM Fellow in Osteopathic Medicine

Jennie H. Kwon, Washington University School of Medicine

FDA Tobacco Regulatory Science Fellowship

A 12-month, multidisciplinary residential program designed for mid-career professionals to gain experience and expertise to further define and develop the field of regulatory science as it relates to the regulation of tobacco products and FDA's authorities under the Family Smoking Prevention and Tobacco Control Act..

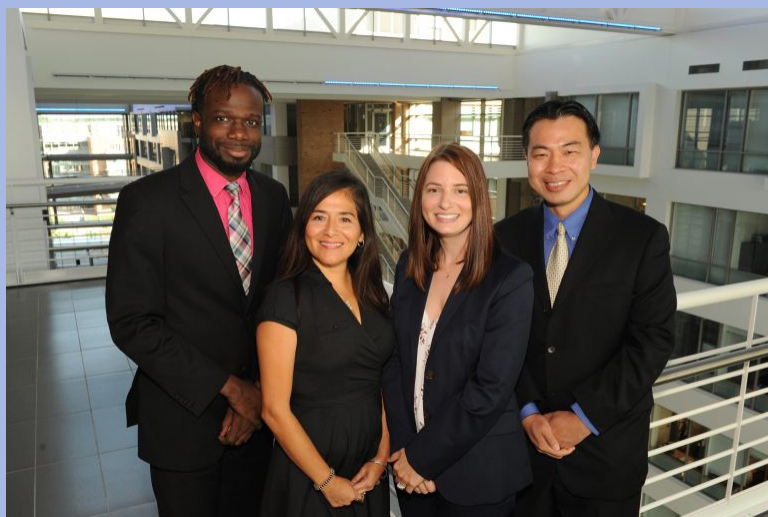
2017-2018 Fellows

Shovaughn Chism, Baltimore City Health Department

Karina Jimenez-Donovan, Booz Allen Hamilton

Mollie Miller, Brown University

Tony Yang, George Mason University



2017-2018 FDA Tobacco
Regulatory Science Fellows

Distinguished Nurse Scholar-in-Residence

Supported by the American Academy of Nursing, the American Nurses Association, and the American Nurses Foundation

A program designed to assist outstanding nurse leaders to play a more prominent role in health policy development at the national level.

2017-2018 Nurse Scholar-in-Residence

Tener Goodwin Veenema, Johns Hopkins University

Human Gene Editing Initiative

The NAM and NAS are co-leading an initiative to inform global decision making in this controversial area.

Director: **Anne-Marie Mazza** (amazza@nas.edu)

Innovation to Incubation

The i2I program champions innovative ideas and cultivates pathways to action to increase the NAM's impact.

Director: **Ivory Clarke** (iclarke@nas.edu)

Leadership Consortium for a Value & Science-Driven Health System

The Leadership Consortium provides a trusted venue for national leaders in health and health care to work cooperatively toward their common commitment to effective, innovative care that consistently adds value to patients and society. Consortium Members are leaders from core stakeholder communities brought together by their common commitment to steward the advances in science, value and culture necessary for a health system that continuously learns and improves in fostering healthier people.

Executive Director: **Michael McGinnis** (mmcginis@nas.edu)

Innovation Collaboratives

Care Culture and Decision Making | Health and communications professionals working collaboratively on providing science-driven health care and communicating effectively about best practices.

Director: **Michelle Johnston-Fleece** (mjfleece@nas.edu)

Clinical Effectiveness Research | Innovative research scientists and institutions—public, private and academic—working to improve research methods, identify priorities, and stimulate innovation.

Director: **Danielle Whicher** (dwhicher@nas.edu)

Digital Learning | Care delivery and health information technology organizations using digital tools to accelerate the effectiveness and efficiency of care, and the real-time development of new knowledge.

Director: **Danielle Whicher** (dwhicher@nas.edu)

Value Incentives and Systems Innovation | Medical, health care, health financing, IT and engineering organizations working to design, develop, test, and evaluate innovative, systems-based approaches to rewarding value and improving care.

Director: **Henrietta Osei-Anto** (hoseianto@nas.edu)

Networks

Patient & Family Leadership Network | The Patient & Family Leadership Network (PFLN) supports ongoing communication, collaboration, and synergy among patient and family thought leaders to advance their equal and full engagement across the healthcare continuum: as equal and effective partners in care decisions, at the community and organizational level through continuous improvement initiatives, and at the policy level.

Director: **Michelle Johnston-Fleece** (mjfleece@nas.edu)

Executive Leadership Network | The Executive Leadership Network for a Continuously Learning Health System (ELN) works to establish the capacity, infrastructure, and culture necessary to drive continuous learning and improvement within and across health care delivery systems by supporting ongoing communication, collaboration, and synergy among executive-level stakeholders with common investments in continuous learning.

Director: **Henrietta Osei-Anto** (hoseianto@nas.edu)

Vital Signs Initiative

An effort that builds on the 2015 *Vital Signs* report to encourage adoption of a streamlined set of core measures of health and well-being in America.

Director: **Y. Claire Wang** (cwang@nas.edu)

Consortium Members

Mark B. McClellan, Duke-Margolis Center for Health Policy, Duke University

David Blumenthal, The Commonwealth Fund

Susan DeVore, Premier, Inc.

Judith Faulkner, Epic Systems

David T. Feinberg, Geisinger Health System

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Patricia A. Gabow, Denver Health (formerly)

Atul Gawande, Ariadne Labs, Brigham & Women's Hospital, and Harvard School of Public Health

Julie L. Gerberding, Merck & Co., Inc.

Paul Grundy, IBM

Brent C. James, Intermountain Healthcare (formerly)

Gary Kaplan, Virginia Mason Health System

Gregory F. Keenan, AstraZeneca

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George Sigounas, Health Resources &
Services Administration

Francis Collins (*Michael Lauer*), National
Institutes of Health

Responding to the U.S. Opioid Epidemic

The NAM is currently fundraising to launch an Action Collaborative that will gather policy makers, health leaders, community organizations, patients, and others to move toward collective action to stem the tide of opioid abuse in the United States.

Director: **Elizabeth Finkelman** (efinkelman@nas.edu)

Richard and Hinda Rosenthal Symposium

For more than 25 years, the NAM has hosted an annual symposium to bring greater attention to critical health issues worldwide. Past topics include pain management, precision population health, and patient safety.

Director: **Meg McCoy** (mmccoy@nas.edu)

Vital Directions for Health and Health Care

The NAM compiled expert guidance from a group of health and health care leaders to inform current and future administrations and other key decision makers, as well as the public.

Director: **Elizabeth Finkelman** (efinkelman@nas.edu)

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Action Collaborative on Clinician Well-Being & Resilience—Charlee Alexander (cmalexander@nas.edu)

Annual Meeting Member Activities—Meg McCoy (mmccoy@nas.edu)

Annual Meeting Public Scientific Program—Elizabeth Finkelman (efinkelman@nas.edu)

Awards—Meg McCoy (mmccoy@nas.edu)

Culture of Health Program—Charlee Alexander (cmalexander@nas.edu) or Ivory Clarke (iclarke@nas.edu)

DC Public Health Case Challenge—Amy Geller (ageller@nas.edu)

Documentary Screening Series—Jenna Ogilvie (jogilvie@nas.edu)

Emerging Leaders Forum—Meg McCoy (mmccoy@nas.edu)

Health Policy Fellowships and Leadership Programs—Gregg Margolis (gmargolis@nas.edu)

Healthy Longevity Grand Challenge—Elizabeth Finkelman (efinkelman@nas.edu)

Innovation to Incubation—Ivory Clarke (iclarke@nas.edu)

Leadership Consortium for a Value & Science-Driven Health System—Michael McGinnis (mmcginnis@nas.edu)

Care Culture and Decision Making—Michelle Johnston-Fleece (mjfleece@nas.edu)

Clinical Effectiveness Research—Danielle Whicher (dwhicher@nas.edu)

Digital Learning—Danielle Whicher (dwhicher@nas.edu)

Patient and Family Leadership Network—Michelle Johnston-Fleece (mjfleece@nas.edu)

Executive Leadership Network—Michelle Johnston-Fleece (mjfleece@nas.edu)

Value Incentives and Systems Approaches—Henrietta Osei-Anto (hoseianto@nas.edu)

Vital Signs Initiative—Y. Claire Wang (cwang@nas.edu)

NAM Perspectives—Jenna Ogilvie (jogilvie@nas.edu)

Responding to the U.S. Opioid Epidemic—Elizabeth Finkelman (efinkelman@nas.edu)

Richard & Hinda Rosenthal Symposium—Meg McCoy (mmccoy@nas.edu)

Vital Directions for Health & Health Care—Elizabeth Finkelman (efinkelman@nas.edu)



The image on the cover is from an original artwork titled **“Neighborhood Community”** by Egbert **“Clem” Evans** of Art Enables in Washington, DC. The piece was submitted for *Visualize Health Equity*, the National Academy of Medicine’s first-ever community art show (more information on page 25).
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