

# The National Academy of Medicine at 50: Celebrating the Past and Envisioning the Future

**Victor J. Dzau, MD**, National Academy of Medicine

March 27, 2023

This Commentary is a lightly abridged version of the 2022 NAM President's Address, delivered by National Academy of Medicine (NAM) President Victor J. Dzau at the NAM's Annual Meeting on October 17, 2022. The President's Address is an annual opportunity for the NAM President to speak to the NAM membership and other stakeholders on emerging and critical topics of interest to the membership and the President. The 2022 President's Address considers how progress in health and medicine have played a critical role in creating solutions to some of society's greatest challenges over the last 50 years and explores opportunities for bold innovation to address for the challenges to come and describes how the NAM can best prepare for this future. A video recording of the full address is available at: <https://nam.edu/event/revolutionizing-the-biomedical-and-health-sciences-nam-annual-meeting/>.

Innovations in health care and medicine have been at the forefront of many of society's biggest challenges. More than 50 years after the founding of the Institute of Medicine (IOM), now the National Academy of Medicine (NAM), the COVID-19 pandemic has in many ways served as a poignant reminder of the Academy's critical role and its responsibility for responsiveness. The NAM and the wider National Academies of Sciences, Engineering, and Medicine (NASEM) were able to quickly pivot, delivering rapid, expert, real-time advice in a time of crisis.

But this nimbleness was not achieved overnight. In fact, it was built on a strong, five-decade foundation in which the NAM has played a major role in advancing some of health and medicine's greatest achievements: launching the global patient safety and quality movement, sounding the alarm on the HIV/AIDS epidemic, and proposing mapping and sequencing the human genome, among many others. There are always new challenges to meet and new innovations to foster. In short, the NAM's work is more important now than ever.

## Fifty Years of Progress

Looking back, our parents or grandparents never could have imagined the explosion of new knowledge, tools, treatments, and technologies that we have today. Our progress in treating heart disease is awe-inspiring. 50 years ago, there were very limited treatments for myocardial ischemia, arrhythmia, and heart failure. Since the 1960s, multiple innovative drugs and technologies have helped prevent some 1.5 million deaths every year (Remington and Brownson, 2011).

Our ability to treat many types of cancer is another modern miracle. We now have 14 million cancer survivors here in the United States, which would have been unimaginable even 30 years ago. More than two in three people diagnosed with cancer will live at least five years, and many will live well beyond that (ACS, 2014). But we are poised to do even better. We can now identify molecular features of specific cancers and tailor targeted therapies to individual patients, and, through immunotherapy, we can harness the immune system to successfully fight cancer. Similarly, HIV/AIDS was once a death sentence. Anti-retroviral therapies, coupled with the tremendous shift in knowledge about how to treat at-risk populations, have transformed the prognosis. HIV can now be managed as a chronic illness, and we can dramatically reduce the risk of transmission.

These amazing achievements were considered the stuff of science fiction by previous generations. Aldous Huxley's 1932 novel *Brave New World* describes a dystopian future society with genetically modified citizens and an intelligence-based social hierarchy. Today, many of the technologies that Huxley predicted—including genome editing, artificial intelligence (AI), and brain-computer interfaces—are no longer limited to one's imagination. But unlike Huxley's bleak depiction, we can apply these technologies to improve human health and well-being while also anticipating potential concerns and consequences in order to mitigate them.

## Assessing the Challenges Ahead

Our world faces many pressing challenges—COVID-19 and future epidemics and pandemics; climate change,

which is already affecting the health of millions; and systemic racism and racial and economic inequality, which are preventing far too many from reaching their full potential for optimal health and well-being. Progress on these issues, among others, is impeded by the continued rise and use of mis- and disinformation to harm the public by eroding trust in our institutions, in scientific research, in the knowledge and expertise of the scientific community, and in the value of science itself.

In the United States, our communities continue to be plagued by familiar and long standing problems. We have experienced far too much gun violence, including tragic mass shootings like those in Uvalde, Texas; Buffalo, New York; and, most recently, in Raleigh, North Carolina; as well as tens of thousands of other firearm-related murders and suicides. At a time when the United States already has one of the highest maternal death rates of any developed nation, the Supreme Court decision to overturn *Roe v. Wade* will potentially worsen women's health and increase inequalities in maternal and reproductive health care, especially for people of color.

Although these are the grim realities we face now—and we will certainly encounter other major challenges and disasters in the years ahead—we also know that science and medicine provide solutions. Big data and AI have the potential to significantly improve productivity and efficiency of care and to reduce medical errors. In biomedical research, AI can help identify new applications for existing drugs and transform the way we pre-screen patients for disease, reducing the need for highly invasive or intensive treatments.

The Chan-Zuckerberg Initiative has set an audacious goal: to cure, prevent, or manage all disease by the end of this century—less than 80 years from now (Topol, 2022). Some researchers believe that humans could one day be made immune to all viruses, and that the effects of aging could not just be prevented—but reversed entirely. These goals might sound like fantasy, but, when we consider how rapidly science and technology are advancing, so much is possible. Consider that only 80 years ago, penicillin was relatively new; there were no vaccines for polio, measles, or rubella; and we had no effective drugs to treat hypertension or heart failure.

It is exciting to imagine where science and technology will bring us in the next 50 years. New developments in genomics, nanotechnology, engineering, and other fields are sparking radical innovations. Gene editing technologies could allow us to prevent or cure Huntington's disease, cystic fibrosis, sickle cell disease, and other devastating illnesses. What's more, researchers are developing single-shot gene therapies that could make these treatments more

readily available and affordable to patients from all countries and backgrounds.

How can we keep making incredible new advances in science and technology while also ensuring these advances benefit all of society? If we have learned anything—especially from the past few years—it is this: scientific advances and technological innovation are instruments of progress, but it is what we do with these instruments that matters. Humanity is impacted by how these instruments are used, who can access them, and the ways in which we share the related knowledge. To achieve true progress, we must strive for transparency, clarity, and accountability throughout the process of innovation. We can only enable trust if we can communicate effectively and consider how innovation will impact our nation and our world.

As a country, we spend 20 percent or more of our GDP on health care, yet many Americans face major barriers to accessing even basic services (CMS, 2021). Sadly, over the past two years, life expectancy has fallen dramatically—by just under three years since 2019 (CDC, 2022). This is unacceptable. As always, some groups are more affected than others. Native American and Alaska Native populations now have an average life expectancy of just 65 years, equivalent to the average American life expectancy in 1944 (Arias et al., 2022). This alarming drop in life expectancy in the United States is not just due to the COVID-19 pandemic. We are seeing more deaths from chronic disease and, of great concern, drug overdose, alcohol use disorder, and liver disease, which Anne Case and Angus Deaton termed “deaths of despair” (Case and Deaton, 2020). Perennial problems of poverty, discrimination, racism, and lack of access to care have even gotten worse, in some cases.

Yet, this does not need to be our reality. Our health care system is one of the best in the world in many ways, but it is also fragmented and inequitable. We prioritize treatment over prevention and fail to address the root causes of disease like social inequality, poverty, and environmental injustice. Science and technology are constantly progressing, but our medical education and training system is falling behind, and our health care providers have been pushed past their limits by the impact of COVID-19. Data science, AI, and other innovations could potentially benefit both patients and providers, but only if we are prepared to take advantage of them in an equitable and just manner. We can't predict everything that will happen in the future, but we can do something far more important: we can help build it. The actions we take now and the decisions that we make every day are determining the future for ourselves and generations to come.

## Building the Future for All

The NAM must be ready to help build the future we all want—one in which advancements are accessible to all people. Our mission is to improve health for all by advancing science, accelerating health equity, and providing independent, authoritative, and trusted advice nationally and globally. To fulfill that mission and meet the many current and future challenges, we need bold thinking, creativity, and a radical shift in the way we operate.

### **The NAM must proactively prepare society to anticipate, adapt to, and respond to future challenges and opportunities.**

To achieve this goal and to inform decisions that build a better world, we must commit to a culture of lifelong learning; enhance our capabilities and innovate through strategic deployment of cutting-edge tools, systems, and technologies; and build diverse and deep networks of partners. Importantly, prioritizing diversity, equity, and inclusion must be at the heart of all we do.

The NAM will continue its unwavering commitment to scientific excellence, integrity, and rigor. We remain steadfast to objectivity and independence, as well as our commitment to catalyze action for the greater good. We will always be a science-based organization. But as science rapidly evolves, we must lead changes in the scientific enterprise and commit to continuous learning and innovation. Embracing a more dynamic future requires taking calculated risks and actively inviting improvement. The NAM has long advocated for the health community to harness knowledge to drive innovation. We need to follow our own advice.

During the COVID-19 pandemic, we saw many examples of accelerated innovation. For example, the NASEM Standing Committee on Emerging Infectious Diseases and 21st Century Health Threats developed a novel mechanism, known as Rapid Expert Consultations, to provide near-real-time, peer-reviewed, evidence-based advice in a matter of weeks to policy makers and the public. We are now improving this successful model so we can rapidly respond to other time-sensitive events.

Although new approaches are sometimes met with skepticism, we know that it is crucial to foster a culture where we are not afraid to try new things—even if we risk failure. Astrophysicist Erika Hamden said: “Discovery is mostly a process of finding things that don’t work, and failure is inevitable when you’re pushing the limits of knowledge” (Hamden, 2019). Failure is an inescapable and valuable part of research.

### **The NAM must begin to consider the future.**

Modern science has already made momentous achievements in understanding the current state of our world. At the NAM, we must also begin to consider the future state of the world. That means not only understanding the challenges we face today, but also envisioning the challenges we will face tomorrow and in years to come. How can the NAM set the future agenda for science and health care? How can we predict and address problems before they have a major negative impact?

To become more anticipatory, we must harvest ideas from diverse new sources and use cutting-edge research and assessment methods like horizon scanning, predictive analytics, and trend forecasting. These methods will allow us to identify early signals of potential change, predict certain situations or events, and leverage data-mining technology to judge what we might expect to see in the future.

Take the pandemic as an example. Despite previous warnings from infectious disease experts, the world was not prepared. In the future, it must be our goal to initiate and lead conversations, not only contribute to them. We must proactively identify emerging problems and opportunities and apply advanced forecasting methodologies to prepare for possible and probable futures.

The NAM should prepare the nation—and the world—on how to best respond to many health care, policy, and economic possibilities. These new methodologies will allow us to be adaptable and effective in the evolving world of science and medicine. To achieve our goals of becoming a more dynamic and enterprising organization, we need to increase our capacity, develop innovative approaches, create new products, and react more quickly to changes. To truly transform, we must use and implement state-of-the-art technology, planning tools, and methodologies.

These innovative approaches are dependent on data. The NAM must embrace increasingly larger data sets, use tools such as AI and machine learning, and link data from multiple sources, including health care data, population and community-level data, and a wide range of health-related data.

### **The NAM must develop our future-ready workforce.**

Our people will always be the backbone of our organization. They are, and will always be, the reason for the quality and excellence of our work, and they embody our principles and values. We need our teams to be adept at continuously learning new skills and capabilities. We must also explore new methods and models that are unlike those we employ now.

Within the next five decades, our employees, members, volunteers, and our workplace will also evolve to meet the needs of the future. We will build a learning workforce, automated and augmented with the use of AI and data science to become increasingly effective and efficient. Our committees could use new technologies, AI, and machine learning to process vast quantities of data and rapidly produce results across a wide array of complicated topics. We could invest in new technologies to strengthen budgeting and forecasting, improve the management of projects and workflow, facilitate collaboration, and enhance the stewardship of member and volunteer relationships. We may be able to use these new tools to produce adaptable reports and deliverables which could be capable of being produced, evaluated, and revised in near real-time, to evolve and adapt with the pace of science. We must begin preparing our workforce to use these new and future technologies to create bold new approaches.

**The NAM must form partnerships with a wider, more diverse range of partners in the health care sphere and beyond.**

We must find ways to communicate, engage, and partner with researchers, opinion leaders, sponsors, private sector, and global institutions. Without broad, diverse engagement, we miss opportunities to acquire new information, identify sources of support or potential pain points, communicate clearly, and ensure our deliverables meet the needs of the communities they will impact.

For example, the NAM initiative on Emerging Science, Technology, and Innovation works with private industry and the venture capital and investment communities that are key stakeholders in addressing societal applications of emerging technology, in addition to scientists and innovators. Similarly, our Grand Challenge on Climate Change, Human Health, and Equity is harnessing innovative, collaborative partnerships with multiple public and private sectors outside health to address this existential challenge. In the global arena, we have ramped up our partnership and collaboration with the G20, G7, World Health Organization, World Bank, and multilateral global health agencies.

The NAM needs deeper engagement at state, city, and community levels, and we must consistently endeavor to bring new perspectives to our work. This will allow us to strive beyond interdisciplinary collaboration to real convergence science, designed to address complex problems crossing multiple sectors.

Of course, we must always strive to preserve our independence and objectivity, and to avoid bias and conflicts of interest. But to solve the complex problems that society faces,

we absolutely must draw upon the expertise of all partners: internationally, regionally, and locally and across the public and private sectors.

On top of this, we must develop a future-looking communications strategy. Advising and convening stakeholders is not enough. We must learn more about our entire audience and how best to reach and listen to them. This includes our members and the general public, but also policy leaders and decision-makers nationally and globally. 50 years ago, social media did not exist, and the world of communication looked very different. We need to use all available tools in the future, especially considering the continuous evolution of social media. Given the world that we live in today, and the rise of dis- and misinformation, we know this task will require a deep understanding of behavior as well as exploring new ways to communicate.

**The NAM must sustain and expand our devotion to diversity, equity, and inclusion in all we do.**

This commitment is rooted in our programs, work, staff, and membership. We must ensure that NAM staff and members represent the diversity of our population on a broad array of demographic factors. Because these individuals are at the heart of what we do, we should ensure that they are offered opportunities that speak to their strengths. We need to create an inclusive and welcoming culture for everyone.

Our concerted efforts to increase diversity are paying off. Last year, from a record number of more than 1,000 nominations, we elected 100 new members representing the most diverse class to date. More than half of our new members are women and half are underrepresented minorities. Three Native American members were elected last year and three this year, bringing the total number of Native American members to seven. The newly elected class also includes a record eight members from underrepresented states.

As we develop into a more future-oriented NAM, we also endeavor to become not only an honor society, based on achievements, but a service organization that is committed to making a difference to health and society. To that end, our member election process has developed mechanisms to ensure the inclusion of younger members and those from underrepresented backgrounds. In addition, we have instituted special emphasis on electing members whose expertise are key to meeting the challenges of our time, such as climate change, technology, and inequality.

This will also require us to induct scientists, clinicians, and experts who represent the future of their fields. We are cultivating the next generation of leaders through our Emerging Leaders in Health and Medicine Program and fellowships portfolio. Although we deeply rely upon wisdom of

our more experienced members, we also need these new voices and creative insights.

Embracing diversity, equity, and inclusion is more than just ensuring diverse representation in our work. We must also work intentionally and thoughtfully to build deep and interactive relationships with diverse communities. More broadly, the NAM must prioritize health equity as the goal that underpins everything we do. NAM programming must address the root causes of inequities: systematic racism, economic instability, lack of community support, and difficulties accessing education and health care.

These goals represent our vision for the NAM's future. In many ways, we are already on our way, as we develop a "refresh" of our strategic plan to roll out in 2023–2024. Our consensus studies have long been considered the gold standard, providing definitive guidance that stands the test of time. But science and evidence are moving fast, and we must keep pace and innovate if we want to make relevant contributions to our ever-changing world. Our institution should strengthen all of its components to achieve continued success, sustainability, and resilience.

### A Bold New Direction

As we mark five decades in service to the nation and the world, we should be proud of how far we've come in health and medicine—and as a premier Academy nationally and globally. We are heading in a bold new direction. We have so much to be excited about in terms of where science and technology may take us, even as we face intersecting and fast-moving challenges, and with so much work ahead.

We are dealing with several existential crises, and without a doubt, many others will surely come our way. But at the same time, reflecting on everything we've already accomplished inspires optimism.

50 years ago, few could have predicted how quickly we would develop effective vaccines and treatments for a pandemic like COVID-19, as well as new methods of tracking, testing, tracing and managing the disease. When the IOM was formed, we wouldn't have dreamed of being on the cusp of curing cancer, preventing heart disease, or altogether eliminating devastating genetic diseases.

What will health and medicine look like in the year 2070? The answer is up to all of us. In the words of the great civil rights activist Ralph Abernathy, "I don't know what the future may hold, but I do know who holds the future." We do—every one of us. Through purposeful efforts and a commitment to equitably advancing science and medicine, we will achieve the NAM's vision of a healthier future for all.

### References

1. American Cancer Society (ACS). 2014. *Advancement of Cancer Survivorship*. Available at: <https://www.cancer.org/treatment/understanding-your-diagnosis/history-of-cancer/cancer-survivorship.html> (accessed February 7, 2023).
2. Arias, E., B. Tejada-Vera, K. D. Kochanek, and F. B. Ahmad. 2022. Provisional Life Expectancy Estimates for 2021. *Vital Statistics Rapid Release*; no 23. <https://dx.doi.org/10.15620/cdc:118999>.
3. Case, A. and A. Deaton. 2020. *Deaths of Despair and the Future of Capitalism*. Princeton University Press: Princeton, New Jersey.
4. Centers for Disease Control and Prevention (CDC). 2022. *Life Expectancy in the U.S. Dropped for the Second Year in a Row in 2021*. Available at: [https://www.cdc.gov/nchs/pressroom/nchs\\_press\\_releases/2022/20220831.htm](https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2022/20220831.htm) (accessed February 7, 2023).
5. Centers for Medicare & Medicaid Services (CMS). 2021. *National Health Expenditure Data - Historical*. Available at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical> (accessed February 7, 2023).
6. Hamden, E. 2019. *What it takes to launch a telescope*. TED2019. Available at: [https://www.ted.com/talks/erika\\_hamden\\_what\\_it\\_takes\\_to\\_launch\\_a\\_telescope](https://www.ted.com/talks/erika_hamden_what_it_takes_to_launch_a_telescope) (accessed February 7, 2023).
7. Remington, P. L., and R. C. Brownson. 2011. Fifty Years of Progress in Chronic Disease Epidemiology and Control. *Morbidity and Mortality Weekly Report (MMWR)* 60(04); 70-77. Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a12.htm> (accessed February 7, 2023).
8. Topol, E. J. 2022. *Cure, Prevent, or Manage All Disease: The Chan Zuckerberg Initiative's Bold Plan is Already Working*. Medscape, April 28. Available at: <https://www.medscape.com/viewarticle/971847> (accessed February 7, 2023).

### DOI

<https://doi.org/10.31478/202303a>

### Suggested Citation

Dzau, V. J. 2023. The National Academy of Medicine at 50: Celebrating the Past and Envisioning the Future. *NAM Perspectives*. Commentary, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202303a>.

### Author Information

**Victor J. Dzau, MD**, is President of the National Academy of Medicine. Dr. Dzau is also a member of the National Academy of Medicine.

### Acknowledgments

The 2022 President's Address benefited from the thoughtful input of **Celynne Balatbat, Molly Galvin, Melissa Laitner**, and **Morgan Kanarek**.

### Conflict-of-Interest Disclosures

None to disclose.

### Correspondence

Questions or comments about this paper should be directed to Victor Dzau at [namedicine@nas.edu](mailto:namedicine@nas.edu).

### Disclaimer

The views expressed in this paper are those of the author and not necessarily of the author's organizations, the National Academy of Medicine (NAM), or the National Academies of Sciences, Engineering, and Medicine (the National Academies). The paper is intended to help inform and stimulate discussion. It is not a report of the NAM or the National Academies. Copyright by the National Academy of Sciences. All rights reserved.