INCREASING THE GLOBAL IMPACT OF SCIENCE: FOSTERING COLLABORATION AMONG U.S. AND AFRICAN SCIENCE ACADEMIES
The value of scientific collaboration continues to increase rapidly as society’s challenges become more complex and global. At their best, collaborations should involve joint efforts at several levels: among individual scientists as well as among institutions, disciplines, and countries. Indeed, the scientific enterprise lends itself to collaborative work, since it has always sought to identify, discuss, and disseminate knowledge widely.

The work of the U.S. National Academy of Sciences (USNAS) benefits from the participation of scientists throughout the world. We seek the multidimensional benefits of international science by electing to our membership distinguished foreign scientists and by appointing international scientific experts to our advisory committees. Without these transnational collaborations, U.S. science would be less well-informed and less advanced, and U.S. policy regarding matters of science, engineering, and health would be less effective. We also value global scientific collaboration because it offers the opportunity to advance not only science but also cross-cultural understanding, peace, and security.

Even though the USNAS was chartered to provide independent advice to the U.S. government, our impact extends far beyond a government audience; indeed, much of our work has relevance throughout the world. Rapid globalization is shifting the center of gravity for economic activity and knowledge. In diverse ways, it is bringing global challenges such as climate change, terrorism, food safety, and antimicrobial resistance to everyone’s doorstep. Globalization is also leading to an explosion of intellectual capital in places that were not considered to be at the forefront of intellectual and economic activity. Consequently, we need to continually shape, inform, and disseminate our work in more effective ways, including by expanding the diversity of our collaborations with academies in Africa and in other rapidly developing regions.

Many African countries are experiencing strong economic growth and improved life expectancies. Academic institutions are growing in number and quality. The number of African science academies has more than doubled in the last ten years, and as a result of effective investments by our African Science Academy Development Initiative (ASADI), these academies are increasingly well positioned to serve their countries by providing authoritative scientific advice. Investments in the African scientific enterprise and in higher education have positioned African countries for greater progress in the coming decades. African scientists are important colleagues and contributors who can enhance the value and impact of our work at the Academies. Whether we appoint African scientists to our boards and advisory committees or seek to partner with African academies in carrying out joint activities, these international collaborations reflect our vital interests as an institution committed to using science to improve the lives of people everywhere.

Ralph J. Cicerone, Ph.D.
President, U.S. National Academy of Sciences

Globalization lifts millions of people into the global economy and out of poverty. It is about collaborations and partnerships across national boundaries. It facilitates access to outstanding, diverse, and complementary world-class scientific insights for all partners that are so needed for the problems we face. History verifies that isolation—which limits access to knowledge—retards advancements in science, engineering, and health because new knowledge builds on a foundation of knowledge. Innovations addressing problems in emerging economies in places like Africa also drive advancements in the developed regions.

We have much to learn from each other. The National Academies, whose work is nonpartisan and evidence based, are valuable assets for advancing science, engineering and health diplomacy, and they complement formal intergovernmental relations. Collaborations between science academies offer us a window into the current and emerging challenges of other countries and insights about the need for solutions across areas as diverse as alternative power sources, sustainable agriculture, and pandemic preparedness. Thus, engaging in collaborations between academies in Africa and the U.S. is a strategic investment that is a critical step to the future. As we progress in the spirit of the ASADI, the National Academy of Engineering is looking forward to contributing to and learning from partners in Africa and in collaborating to ensure that the work we undertake together achieves its goals. Engineering is about creating solutions that serve people and society.

C. D. (Dan) Mote, Jr., Ph.D.
President of the National Academy of Engineering
The Institute of Medicine’s mission is to advance the health of persons everywhere. To shape the best policies in addressing global scientific and health problems and to foster the uptake of these policies, we must get the best evidence to the right people at the right time. We must also foster expert and rigorous deliberation. Health issues ranging from influenza and multi-drug-resistant tuberculosis to environmental threats, food safety, and counterfeit drugs are global issues of vital importance to the United States. The needed innovations to respond to these and other problems will not simply emanate from more developed countries. We must be open to learning from others in all parts of the world and to overcoming barriers to innovation in order to benefit all peoples.

Sharing scientific knowledge across borders leverages the talents and insights of those in the global scientific community and accelerates change that is in our national interest. Science academies are natural partners in this enterprise. The science academies in Africa—given the rapid development of the continent, its unique challenges, and the academies’ home-grown credibility—have a key role to play in educating local and international “change agents” with evidence they can understand and act upon. It is incumbent on us to collaborate with these younger African science academies in an open and multidirectional manner. Academies working together can most effectively develop, disseminate, and apply scientific knowledge. Such cooperation will improve the quality and impact of our own advisory processes and will advance our collective interests.

Victor J. Dzau, M.D.
President, Institute of Medicine (IOM)
National science academies exist in more than 150 countries. Since the founding of the oldest academies over 300 years ago, these institutions have advanced science by recognizing exceptional achievement, by fostering intellectual advances at the frontiers of knowledge, and by disseminating new scientific insights. As the potential for science to benefit society became more evident, some science academies took on a role of managing national research programs or of providing formal scientific advice to governments and other stakeholders.

The USNAS is an example of how a science academy can serve as an independent, evidence-based adviser to government. It was founded with a Congressional charter in 1863 with the mandate to shape the scientific enterprise and national policy in the United States. In recognition of its status as the nation’s most authoritative scientific organization, numerous academies throughout the world seek to emulate the USNAS advisory role, which is a useful development because scientific issues such as climate change, energy, agricultural productivity, environmental sustainability, biodiversity, cybersecurity, and emerging infections have global dimensions with international policy implications.

Over the last fifty years, a movement has emerged to develop science academies in Sub-Saharan Africa. The first, the Ghana Academy of Arts and Sciences, was founded in 1959. Now, about 20 more science academies have followed its lead. Like many academies, the earliest African science academies were primarily honorific societies. Over time, however, it became apparent that the challenges facing Africa would benefit from the academies’ adoption of a formal advisory role in national science policy. In 2004, in response to the vision outlined by Bruce Alberts, then the USNAS President, the Bill and Melinda Gates Foundation awarded the USNAS a ten-year grant to assist African science academies in developing stronger science-advisory capabilities. This collaborative endeavor between the USNAS and nine academies across Africa has come to be known as ASADI, the African Science Academy Development Initiative.

“There is clear evidence that progress can be achieved in low-income countries; however, many African countries are not yet fully exploiting existing scientific knowledge. National academies of science have an important role to play by sharing the best knowledge and engaging decision-makers more actively by translating evidence-based science into appropriate policies.”

—Kofi Annan, former Secretary General of the United Nations
Words of welcome at the Fifth Annual ASADI Meeting,
Accra, Ghana, November 2009
A VISION FOR COLLABORATION IN AN AGE OF RAPID GLOBALIZATION

Sciences academies recognize that solving the most important scientific problems is rarely the domain of a single discipline. Similarly, with globalization many scientific issues have multinational dimensions, and no single nation has a monopoly on the needed insights. A failure to recognize this would constrain scientific advances in the laboratory, in the field, at the bedside, and in the policy arena. Collaborations that are multidisciplinary, multisectorial, and multinational often achieve greater credibility, legitimacy, and impact. National science academies can partner and thereby complement each other in areas such as accessing evidence and technical expertise, engaging local experts or political leaders, reconciling global insights with local conditions, achieving a broad sense of legitimacy and balance, disseminating reports internationally so as to achieve a larger impact, and providing assistance to newer academies through relationships with funders. Most importantly, inter-academy collaboration represents a commitment to extending the power of science to all societies and their governance. Such collaboration is a matter of social justice, and addressing it is an element of an academy’s social responsibility to the larger society.

“It is critically important that science, and scientists, achieve a much higher degree of influence throughout both their nations and the world. For effective societies, we need governments that base their policies on what scientists predict about the effect of current actions on the future (global warming is just one of many examples). But we also need to spread scientific values, because from all of the world’s citizens we need much more of the creativity, rationality, openness, and tolerance that are inherent in science—what Indian Prime Minister Nehru called a ‘scientific temper.’ Academies of science will be instrumental in this urgently needed spreading of science and its values. Thus, those of us in more scientifically advanced nations must help less-advanced nations develop a greater capacity in science and technology, as appropriate to their national needs. This is in our own interest, as well as being critical for the rest of the world.”


Photo credit: Tom Kochel, 2008.
WHY AFRICA?
The Motivation Behind U.S.-Africa Scientific Collaboration

Today, in Africa and elsewhere, scientific solutions that enable human survival and well-being must be pursued within strategies that recognize the interdependence between human health, education, and scientific knowledge and the viability of environmental, economic, and geopolitical systems. Three compelling reasons illuminate the need for and the benefits that can be derived from scientific collaboration between the U.S. and Africa. First, Africa is a burgeoning global power, restrained in its aspirations by poverty and other challenges. For Africa to realize its economic potential, science, technology, and innovation will be key. Africa reflects not only profound underdevelopment but also untapped economic potential. Second, in an era of globalization, Africa’s challenges—with diseases, malnutrition, education, road traffic safety, natural-resource exploitation, power and communications infrastructure, violence and other forms of societal instability, involuntary migration, and climate change—all have effects that resonate internationally. And third, with over a billion people, half under the age of 20, Africa is an important source of human capital for the future as well as an important emerging participant in the global economy.

One indication of the importance of Africa was the establishment by the U.S. Department of Defense of the Africa Command in 2008. And since 2004, through the President’s Emergency Plan for AIDS Relief (PEPFAR), the U.S. has spent over $50 billion on HIV/AIDS prevention, treatment, and care in developing countries, mostly in Africa. It is in the interests of the U.S. to help Africa escape its many burdens, and science is central to the sustainable development necessary to do so.

Looking ahead, democracy, respect for human rights, economic investment, and strong civil-society institutions (including science academies) will be the underpinnings of a prosperous and peaceful Africa. To this end, ASADI has sought for more than ten years to help African science academies position themselves to be the evidence-based science advisers of choice in their nations.

“The central argument of evidence-based practice is hard to refute. In essence it says that policymakers and practitioners take upon themselves to intervene in the lives of others, intending to do good but sometimes doing more harm than good.

“To minimize the risk of harm, it is argued that interventions should be informed by reliable research evidence, and that evidence-based or evidence-informed decision-making should always be undertaken whenever possible. Not to do so would be to act irresponsibly.”

—Jimmy Volmink, Academy of Science of South Africa (ASSAf)

The scientific enterprise is not well integrated into the lives of most Africans, yet the development needs of Africa demand scientific solutions. In recent history, striking examples of gaps in the use of science to inform policy and practice have been evident in approaches to HIV/AIDS in South Africa, to polio control in Nigeria, to tobacco control across the continent, and in the rejection of genetically modified crops in various African countries. Although there are thousands of scientists in Africa, few have been prepared for a policy role. In contrast to many more economically advanced countries, the societal demand for scientific advice in African countries has historically been low. In contrast to more science-based societies, the African media tend to be less well prepared to assess and communicate science and the implications of science for policy.

“While many elements within a nation can produce credible scientific advice, a science academy can do so with a unique level of credibility due to its independence from non-scientific influences, the degree of access to leading experts and scientific literature, and the use of rigorous consensus and external review methods...It would be ideally reasonable for policymakers to insist that no policy decision is justified without a strong evidence base to substantiate it.”

—Hon. Patrick Amuriat Oboi, Member of Parliament, Uganda
 ELEMENTS OF U.S. NATIONAL ACADEMY OF SCIENCES COLLABORATION WITH AFRICAN SCIENCE ACADEMIES

Since 2004, the USNAS has used multiple mechanisms to advance global science advising through collaboration with African science academies. The benefits of these collaborations have been bidirectional and cross-sectorial. African scientists appointed to USNAS committees have added unique insights to studies and other activities that advise U.S. policymakers. At the same time, they have absorbed important lessons about how a science academy can foster good governance through its active role in civil society. For many topics, studies involving African scientists have increased the report’s credibility both in the U.S. and in Africa.

The U.S. Academies of the Sciences, Engineering, and Medicine have elected 14 Foreign Associates living in six African countries. The selection of these colleagues confirms their international stature and the value the USNAS places on involving them in service for the advancement of the global public good. Their expertise and cultural perspectives add value to the Academies’ advisory reports, not only through the creation of advisory products but also through facilitation of the global dissemination of these reports.

“In 2008 I served as a member of the IOM’s consensus committee that produced The U.S. Commitment to Global Health: Recommendations for the New Administration. In 2011 I had the stimulating experience of leading the Ugandan National Academy of Sciences’ consensus committee that disseminated and contextualized for the Ugandan setting the IOM report Preparing for the Future of HIV/AIDS in Africa: A Shared Responsibility. And in 2012 I became a founding member of the IOM’s Global Forum on Innovation in Health Professional Education. My students at Makerere University have benefited from connecting to the Forum via the webcasts. Much of the work of the U.S. National Academies has global relevance and is very useful in countries like my own. I have also appreciated the opportunities to bring insights from Uganda to scientific debates at the National Academies in Washington and to grow in my appreciation for the role of science academies in advising national governments.”

—Professor Nelson Sewamkambo, IOM Foreign Associate, President of the Uganda National Academy of Sciences, and Principal of the Makerere University College of Health Sciences

Photo credit: Makerere University

The signature advisory product of the USNAS is an evidence-based study carried out by leading experts that provides recommendations to key audiences. The execution of these studies follows formal processes in which committees of scientists with diverse expertise and backgrounds are empaneled after being vetted for biases and conflicts of interest. Subsequently, the committee takes public testimony, analyzes evidence, and formulates conclusions and recommendations that are subjected to a rigorous, independent peer review. Since 2004, over 30 African scientists have served as appointed

OPPORTUNITIES FOR COLLABORATION BY U.S. AND AFRICAN ACADEMIES MEMBERS

• Service on academy boards
• Membership in forums and roundtables
• Service on workshop-planning committees
• Partnerships between U.S. and African academies to co-host workshops
• Service on advisory committees
• Service as peer reviewers for academy reports
• Partnerships for report-dissemination activities
The goal of convening activities such as conferences, workshops, and roundtables is to illuminate timely scientific subjects from a range of perspectives. Efforts concerning our global environment, the spread of influenza and antimicrobial resistance, the exchange of information and the use of intellectual property, disaster preparedness, and our thirst for energy all require USNAS projects to obtain insights from beyond our shores. With the development of African science academies, there are now highly competent counterparts on the African continent for high-quality scientific discourse. Many of these academies have been engaged in recent years to mutually beneficial effect. Several USNAS programs have partnered with African science academies for joint workshops around issues such as multi-drug-resistant tuberculosis in South Africa, mental health in Sub-Saharan Africa, and the prevention of intimate-partner violence in East Africa.

“Beginning in 2009, when I was the Chair of the IOM Forum on Neuroscience and Nervous System Disorders, we organized several workshops in partnership with the Ugandan National Academy of Sciences, focusing on quality of care for mental and neurological disorders in Sub-Saharan Africa. These workshops in Kampala provided hundreds of attendees from 16 countries with an incredibly rich opportunity to learn from each other and discuss ways to enhance professional training in local contexts. Partnerships like this greatly enrich the value of a forum’s deliberations and broaden its global relevance and impact.”

—Alan Leshner, Ph.D., IOM member and Chief Executive Officer of the American Association for the Advancement of Science

“Worldwide, tuberculosis (TB) is the leading bacterial cause of death, and now drug-resistant TB (DRTB) has become a looming global concern. Between 2010 and 2013, the IOM Forum on Drug Discovery, Development, and Translation held four workshops on DRTB in four high-burden countries (South Africa, Russia, India, and China). These events illuminated the need for radical policy changes to prevent TB from becoming once again widely incurable. In each country, Forum members learned that the magnitude of DRTB is underestimated; that only a small number of patients receive treatment; that over 90 percent of patients are treated without reference to drug-susceptibility data; and that resistant strains are spread between humans far more than previously appreciated. Were it not for partnering in each country with sister academies, particularly the Academy of Sciences of South Africa, the Forum could not have reached the most knowledgeable experts and would not have formed an accurate picture of the challenge.”

—Gail Cassell, Ph.D., IOM member
Senior Lecturer, Department of Global Health and Social Medicine, Harvard Medical School, and Senior Scientist, Brigham and Women’s Hospital
A mutually beneficial approach to both capacity building and the creation of more credible National Academies reports has been to appoint African scientists to USNAS advisory committees. In 2011, the U.S. Department of Health and Human Services requested that the IOM develop a decision-support tool to assist in the prioritization of vaccines for future development. The stakeholders felt that such a tool should be flexible enough to be of use in both high-income and low-income countries facing different infectious-disease challenges and having different approaches to applying values to decision-making.

“A key factor behind the creation of SMART Vaccines—a software tool to aid strategic planning in vaccine development—was the need for a globally relevant decision-support system. Having on the committee health practitioners, policy advisers, and industrial leaders—especially from Africa and other continents—informed and broadened our thinking and helped improve the software design.”

—Guru Madhavan, Ph.D., Study Director, SMART Vaccines Committee, IOM

Photo credit: Jonathan Cohen/Binghamton University

The IOM committee that produced this tool and an accompanying report entitled *Ranking Vaccines: A Prioritization Framework* benefited from the committee service of both the President of the Ethiopian Academy of Sciences (an internationally respected pediatrician and public-health leader) and the President of the Nigerian Academy of Sciences (a virologist who has played a key role for the World Health Organization [WHO] in polio control in Africa). The experience gained from their committee service enabled these leaders to establish a specific vision for how their own national academies could carry out advisory studies in their countries. Interacademy collaborations under ASADI have also included the completion of advisory reports branded by one or more African academies or with joint U.S.-African academy branding.
The USNAS was chartered in 1863 with the explicit charge to be a science adviser to the U.S. government. The target audiences for advice have since extended beyond the U.S. government to stakeholders throughout the nation at all levels of society. Numerous examples of USNAS domestic impact can be documented across time and sectors. The authority and quality of USNAS reports have captured the attention of other countries. The majority of reports often have substantial relevance for other countries. These studies include not only reports that focus on well-recognized global issues, such as climate change or emerging infections, but also reports that address challenges common to multiple societies, such as obesity and dietary standards, child abuse, and vaccine safety.

Typically, USNAS advisory studies cost over $500,000 and often exceed $1 million. This sum, even when adjusted for developing-world incomes, vastly exceeds the resources typically available for similar efforts in low- and middle-income countries. However, USNAS studies originally intended for a U.S. audience or a general global audience can often serve as an efficient starting point for a much less expensive adaptation to the context of a low- or middle-income country.

In the mutually beneficial spirit of increasing the global impact of USNAS work and of building the capacity of African academies to affordably address important scientific issues of local importance, ASADI has fostered an innovative approach to capacity-building termed “contextualization.”

Contextualization studies disseminate an Institute of Medicine/National Research Council study to a particular foreign audience to initiate African academy advisory processes and to create an advisory product with local relevance.
As part of evidence gathering for an IOM consensus study on long-term strategy for responding to HIV/AIDS in Africa, a joint workshop was held in Pretoria, South Africa, by the IOM and the Academy of Science of South Africa (ASSAf). The 12-person consensus advisory committee included six highly respected scientists from Africa, with two of those from South Africa, and two from Uganda. In 2010, the IOM issued its report, *Preparing for the Future of HIV/AIDS in Africa: A Shared Responsibility*, which incorporated insights from the joint workshop.

“Preparing for the Future of HIV/AIDS in Africa: A Shared Responsibility was a unique effort in that half of the committee was from Africa and the other half from the U.S. and U.K. My Ugandan co-chair and I found that this approach added credibility and fostered local buy-in to the report’s messages. To that end, after the report was released, Ugandan and South African colleagues took it as a starting point to adapt or contextualize it for their specific national context. This is an innovative way to foster uptake in nations that may not have the resources to carry out a full consensus study from scratch.”

—Tom Quinn, M.D., IOM Member
Consensus Committee Co-Chair

After the study’s release, the African committee members were well positioned to explain and to disseminate the report in Uganda and South Africa. Several members were involved with projects by the South African and Ugandan Academies to affordably reinterpret the work to reflect the local context. These two reports are the products of those contextualization efforts.
THE AFRICAN SCIENCE ACADEMY DEVELOPMENT INITIATIVE

To complement involvement of African scientists in the work of the USNAS, the dominant and most direct mechanism for African science academy capacity-building by the USNAS has been the ASADI.

In 2004, ASADI received a $20 million grant from the Bill and Melinda Gates Foundation. Substantial additional support for specific activities has been provided by many other foundations, government agencies, development banks, and industries. The ASADI program was conceived as a partnership that would draw on the strengths and experience of the entire USNAS complex. The staff members needed to carry out the capacity-building have been drawn from most USNAS program divisions, as well as from entities such as the Office of News and Public Information and the various Executive Offices. The overarching goal has been to assist African partner academies to systematically strengthen all of their constituent functions.

The ASADI program has had two main objectives in positioning African science academies to serve as robust advisors. Beyond the initial task of building their governance, advisory, and support capacities so they can provide an excellent and uniquely rigorous approach to policy advising, the Initiative has also embraced the task of developing external-stakeholder appreciation for academy advice.

Since the establishment of ASADI in 2004, its objectives have been to:

- Enter into intense capacity-building partnerships with three (later expanded to five) diverse African academies of science that demonstrate exceptional promise to provide evidence-based health-policy advice;
- Begin less-intense partnerships that are focused on strategic planning and convening skills with additional African academies;
- Provide extensive training for staff members from each intense-partner academy to prepare them to support the conduct of policy-advisory activities;
- Promote discussion of evidence-based policy development in cross-cutting areas of health and sustainable development;
- Strengthen the governance, managerial, and fiscal capacities of African academies of science;
- Develop physical and organizational infrastructure in each academy;
- Strengthen the network of African academies through annual symposia and collaboratives that enable participating academicians, policymakers, and academy staff to learn from and support each other as they develop their policy roles;
- Develop demand from African governments and civil-society organizations for evidence-based policy advice from African academies of science; and
- Externally evaluate project outcomes and the processes used to achieve them.
High-quality video communications links have made collaboration with African academies more cost-efficient and practical. The photo to the left shows a discussion with the Ethiopian Academy of Sciences, whereby ASADI staff members have complemented an on-the-ground presence for training in Africa with video-teleconferences between Washington, DC, and several African countries.

In 2004, eight science academies in Sub-Saharan Africa applied to participate in ASADI. These were the national academies in Cameroon, Ghana, Kenya, Nigeria, Senegal, South Africa, and Uganda as well as the pan-African African Academy of Sciences. After site visits and extensive review of documentation, the science academies of Nigeria, South Africa, and Uganda were chosen as the first three intense partners for capacity-building. Subsequently, the Ethiopian Academy of Sciences, founded in 2010, and the Cameroon Academy of Sciences entered the program as intense partners. Since 2004, the academy movement in Sub-Saharan Africa has flourished, with about 20 science academies in existence by 2014.

The first ten years of the ASADI program focused on U.S.-African collaborations to strengthen African academy governance, infrastructure, convening and advisory functions, fundraising, and communication capabilities. Deepening relationships with government and other stakeholders was also an area of concentration. Building upon insights the USNAS took 150 years to acquire, the African academies have been able to move much more rapidly to become providers of authoritative, home-grown, scientific-evidence-based advice. Throughout this process, the relationship between the USNAS and its African counterparts has also evolved. While each party contributes different assets to achieve common goals, through ASADI the relationships over the years have progressed from those of mentors and protégés to those of full partners ready for a new level of collaboration.

By working together, the USNAS and its African academy partners have been able to advance the science-advising capacity in many African countries, a capacity that serves to benefit not only citizens of those countries but also the global community. The African academy partners routinely demonstrate their ability to convene the best scientific minds from across the continent and to attract the interest of European science academies and other international funders, including the World Bank; the Africa Development Bank; the Bill and Melinda Gates Foundation; the Rockefeller Foundation; the Ford Foundation; the Sloan Foundation; the Wellcome Trust; the U.S. Department of State; the Canadian International Development Research Centre (IDRC); PATH/MVI; the GAVI Alliance; and Pfizer.

As has been established by the publication of more than 50 scientific reports by these organizations since ASADI began, the African academies are now able to clarify emerging scientific issues and to provide outstanding independent and apolitical advice. Individually, and through partnerships with other academies, the African science academies are increasingly well positioned to take their place as true partners in the resolution of scientific challenges facing the global community.
HIV/AIDS, TB and Nutrition: Scientific Inquiry into the Nutritional Influences on Human Immunity with Special Reference to HIV Infection and Active TB in South Africa

In 2007, the ASSAf released a critically important report: HIV/AIDS, TB and Nutrition: Scientific Inquiry into the Nutritional Influences on Human Immunity with Special Reference to HIV Infection and Active TB in South Africa. To address various nonscientific claims concerning the role of certain foods in the treatment of HIV/AIDS, a study committee assessed the influence of nutrition on the course of HIV/AIDS and TB. The ASSAf committee followed committee procedures very similar to those used by the USNAS. Amid widespread controversy at that time over South Africa's AIDS policies, the committee concluded that neither food nor food supplements were alternatives to drug therapy for the treatment of those afflicted with HIV/AIDS. The report received widespread media coverage that included an hour-long televised discussion on the Africa Channel, which is viewed by millions. The report was also prominently covered by global media outlets such as SciDev.Net, The Guardian, The New York Times, The Washington Post, and The BBC Online. The report represented the first time that South African scientists had acted under the banner of an independent, authoritative scientific body to address collectively a critical national threat.

The Scope of Biosafety and Biosecurity in Uganda: Policy Recommendations for the Control of Associated Risks

In 2008, the Ugandan Cabinet approved the National Biotechnology and Biosafety Policy, which established a system whereby the country can benefit from safe applications of modern biotechnology while assessing and addressing any potential risks from those applications. In 2009, the Uganda National Council for Science and Technology developed the Biotechnology/Biosafety Bill, which was meant to implement the 2008 policy and to minimize and manage any potential risks to the environment and human health that may be associated with genetically modified organisms. Ugandan policymakers then wanted to know whether this bill should include biosafety and biosecurity measures for medical and scientific laboratories working with pathogens and infectious agents. To address this issue, the Uganda National Academy of Sciences (UNAS) convened a multidisciplinary committee of experts that completed a report with ten conclusions and six recommendations. This study was done in an effort to better position government officials as they weigh the pros and cons of government intervention in laboratories and the sorts of regulatory frameworks that might be implemented to ensure safe and secure labs while minimizing undue burdens. The U.S. Department of State provided funds to finalize, publish, and disseminate the report.

A Decision-Making Framework for Malaria Vaccine: Planning for a National Decision on Malaria Vaccine

In 2010, the UNAS was asked and funded by the PATH/Malaria Vaccine Initiative to convene a workshop to help position Uganda for the anticipated licensure of a vaccine against malaria. This assignment highlighted the potential value of an independent, evidence-based scientific body for generating national advice on immunizations in order to facilitate the efficient introduction and use of new vaccines, such as those for malaria, pneumococcal disease, and rotavirus. To that end, in 2012 the Ugandan Advisory Committee on Vaccines and Immunization (ACVI), comprising twelve nonpartisan experts, was formed by UNAS with the endorsement of the Ministry of Health. The ACVI has three main objectives: to provide apolitical, evidence-based policy guidance to the government; to provide the Ministry of Health with context-specific prioritization regarding the use of new and underutilized vaccines; and to track the progress of vaccines and immunization practice throughout Uganda and internationally in order to provide better advice on planning for Uganda’s future needs. The Ugandan ACVI is on track to be formally designated as the Ugandan National Immunization Technical Advisory Group (NITAG). Several other African academies are seeking to follow the UNAS example in developing NITAGs.
Parallel Workshops in Ethiopia, Nigeria, and Uganda on the Role of Agriculture in Improving the Nutritional Status of Women and Children in Africa

Children in many African countries suffer high rates of stunting and wasting as a result of malnutrition. As a result, improvement of the nutritional status of African women and children has been an ongoing interest of African science academies. Early malnutrition can result in irreversible deficits with respect to stature and learning abilities. Such cognitive deficits have been shown to remain through adulthood and negatively affect a nation’s gross domestic product. Agricultural policies in Africa have traditionally been insensitive to nutritional outcomes in the design of national agriculture programs and systems. To the surprise of some, improvements in nutritional indices did not automatically flow from gains in agricultural production. To advance the focus on nutrition in Africa’s agricultural programs and policies, the Bill and Melinda Gates Foundation, separate from the ASADI grant, provided funding through the U.S. National Academies to three African academies in order to illuminate the need to improve the coordination of the agriculture and health sectors. The science academies in Ethiopia, Nigeria, and Uganda each convened workshops to address this issue. Through these convening activities, it became apparent that an enlightened mix of policies and programs holds the potential for improving the nutritional status of a country’s most vulnerable populations; that multi-sectorial approaches—which include not just agriculture and health but also gender and education—are more effective than single-sector interventions; and that communities need to be empowered to shape nutritional interventions. Opportunities for harnessing governmental capacity to these ends were also noted.

Integrated Disease Surveillance and Response (IDSR)—Bridging the Gaps

In West Africa, as in other parts of Africa, infectious diseases—respiratory infections, malaria, tuberculosis, HIV/AIDS—account for a great proportion of morbidity and mortality. Despite the adoption in 1998 of the Integrated Disease Surveillance and Response (IDSR) strategy in Africa, communicable diseases still account for most of the burden of disease in the region. Consequently, in August of 2010, the Nigerian Academy of Science gathered experts to hold a workshop entitled Integrated Disease Surveillance and Response (IDSR)—Bridging the Gaps. The meeting was supported by U.S. Department of State, the Nigerian Federal Ministry of Health, the U.S. Centers for Disease Control and Prevention, and the WHO.

“Over the ten years of ASADI collaboration, the Nigerian Academy of Sciences has grown both in size and diversity of its membership, enabling it to achieve a heightened level of national prominence as the country’s science academy. The government has recognized our value through a generous endowment, active participation in our public convening activities, and even commissioning the Academy to accredit Federal science agencies. The academy has also broadened its partnerships to include local and international foundations and private companies. We are thus now a well-positioned platform to advance evidence-based policy in Nigeria, the most populous country in Africa. As the Foreign Secretary of the Nigerian Academy of Sciences, I remain committed and seek to build mutually beneficial collaborations with the scientific community throughout the world.”

—Professor Olaitan Soyannwo, FAS
Foreign Secretary, Nigerian Academy of Sciences
The bonds between African science academies built through the ASADI program have positioned them to undertake joint studies in order to provide a more forceful and authoritative voice on scientific matters of common interest across the continent. In 2014, the report *Preventing a Tobacco Epidemic In Africa: A Call for Effective Action to Support Health, Social, and Economic Development* was the product of a partnership between eight African science academies, the Network of African Science Academies (NASAC), and the ASADI program. The Campaign for Tobacco-Free Kids funded representatives of seven academies to execute this study under the co-chairmanship of health leaders from Nigeria and Uganda. The main outcome was the production and continental dissemination of an authoritative, evidence-informed, tobacco-control policy document, which was jointly endorsed by eight African science academies and the NASAC. Documenting the emerging problem with tobacco on the continent and highlighting an underappreciation of the threat on the part of national leaders, this document was designed to summarize the evidence of the negative effects of tobacco on Sub-Saharan Africa’s health, economy, and development and to recommend tobacco-control strategies for Africa.

*The Honourable Sarah Opendi, Ugandan State Minister in charge of Primary Health Care, launching the report. Photo credit: Ugandan Academy of Science*
Major conferences have been hosted each year of the ASADI program by one of the African science academies to foster greater understanding of evidence-based policy advice and to highlight current public-policy challenges in which the rigor of an academy’s advisory processes could add value for decision-making. These conferences have also been a forum for sharing progress and knowledge gained through policy-advisory activities and for strengthening relationships among representatives from African science academies and the African policy-making community.

“Hosting the annual meeting of African science academies three years after our own academy was established is an honor, and provides us a unique opportunity to raise awareness of how academies can provide policy advice on a national as well as continental scale.”

—Professor Demissie Habte, Founding President, Ethiopian Academy of Sciences, 2013 Annual Meeting Host

The Fifth Annual Meeting of the African Science Academy Development Initiative: Improving Maternal, Newborn, and Child Health in Sub-Saharan Africa was held in Accra, Ghana, from November 9 to 11, 2009, and was hosted by the Ghana Academy of Arts and Sciences as part of its 50th anniversary celebrations. The conference provided an opportunity to explore the possible contributions that African academies of science can make in improving maternal and child survival. *Science in Action*, a companion policy document, was developed by the eight African academies and launched at this meeting. *Science in Action* presented an overview of the status of maternal, newborn, and child health (MNCH) in Sub-Saharan Africa and was targeted at policymakers, program implementers, and partners such as donors (G7), the African Union, UN agencies, and policymakers supporting programs in developing countries. It was disseminated during the conference to representatives from the WHO, UNICEF, UNAIDS, the GAVI Alliance, the Ministries of Health of all seven partner countries, and other stakeholders and individuals involved in MNCH research. Dissemination of *Science in Action* is still ongoing, and targets key stakeholders involved with MNCH policy issues across the globe.

Highlights of the meeting also included welcome messages from His Excellency Kofi Annan, the former UN Secretary General, and from Mary Robinson, Chair of the Board of the GAVI Alliance. In addition, the presidents of the science academies of the U.K., the U.S., and Germany delivered welcome messages at the opening ceremony via video. In all, about 200 delegates from Ghana, Senegal, Uganda, Nigeria, South Africa, Tanzania, Burkina Faso, Malawi, the U.S., Germany, and the U.K. attended; they represented scientists, policymakers, donor agencies, and other key stakeholders involved in maternal- and child-health issues.
Impact is the objective of advisory activities at both the USNAS and its sister academies in Africa. In previous decades, it was natural for impacts to be considered in a national context. The globalization of knowledge, economies, science, and approaches to governance prompts a more expansive view of impact, one that seeks to effect positive change both within and outside individual countries.

Impact can be assessed against a range of metrics. These include changes in policy; the passage of legislation or treaties; the appropriation of funds for domestic or international purposes; the implementation of recommended programs; research directed or requested; convening activities or hearings; media coverage; and the professional discussion of the issues. Even increased awareness of an issue is a valuable form of impact. The 21st century has provided many communication tools to foster impact on a regional and global scale; some of these tools make collaborations between U.S. and African academies more logistically or economically feasible. The core objective, however, is to deliver authoritative, independent advice more effectively through the power that accrues when a diverse group of outstanding scientists works together to illuminate issues and to formulate the most insightful consensus advice possible. For many issues to achieve maximum impact, that diversity should incorporate collaboration with partners in other parts of the world.

Workshops of the Institute of Medicine’s Board on Global Health’s Global Forum on Innovation in Health Professional Education commonly feature video links to the institutions of forum members from outside of the U.S. In this case, students and faculty in Uganda, South Africa, and India observe the presentation of a South African member of the Forum.
Africa is a region of significant importance to the U.S. and the world. It is home to more than one billion people, many of whom live in poverty. However, a growing number of African countries are also showing impressive levels of economic growth and are increasingly choosing democratic forms of government. Science in Africa is thus being positioned to achieve progress of both continental and global significance.

The USNAS and other academies in economically developed countries recognize that they have a vital interest in strengthening science academies in low-income and middle-income countries. Both humanitarian interests and enlightened self-interest are factors. Such engagement can increase the impact of an academy’s work. Cooperation within the science community can foster understanding in settings where political and cultural differences often foster intolerance. Our assistance in helping African science academies take up a leading, independent advisory role in their societies is a statement of our humanitarian and democratic values, and it offers a way for African academies to contribute to good governance.

The support for academy capacity-building from the Bill and Melinda Gates Foundation has established sound platforms for further advisory work by and with partner African academies. The potential of these organizations to support Africa’s development and to create a more secure, sustainable, and prosperous world is emerging with great promise for the future. The partnerships established by ASADI represent an investment in the futures of both the U.S. and Africa. Academies in the U.S. and abroad have the opportunity to exercise these partnerships through exchanges of scientific experts to serve on study committees, through joint workshops, through training and dissemination events, and through contextualization studies that elevate the global impact of USNAS work. This capacity is well positioned to tackle issues of infrastructure, power, water, nutrition, climate change, and health.

Africa and African science academies are moving forward and wish to contribute to global development and security as equal partners with their counterparts in other parts of the world. Individually and collectively, these academies and their members are prepared to participate in fruitful collaborations with academies in higher-income countries. This reflects our common search for truth and respect, as well as our interdependency in a globalized community. The personal and professional rewards of these collaborations are great, but the value for advancing the impact of scientific approaches to problem solving represents the highest aspirations of the global scientific enterprise. Indeed, this collaborative approach points the way forward.

The Honorable Christine Ondoa (second from the right), the then Minister of Health of Uganda, meets at the National Academies Keck Center with the Chair of the Ugandan Academy’s Advisory Committee on Vaccines and Immunization, the ASADI Director for Strategy and Program Development, and ASADI Board Director.
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