U.S. Engagement in Indian Health Care
What Is the Impact?
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WHAT IS THE IMPACT?

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When India became independent in 1947, the country was known for its grinding poverty, crushing illiteracy, and omnipresent illness. Six decades later, India has made enormous advances in both economic development and human quality of life. The go-go economic growth that has excited world attention since the early 1990s is expected to reach 8.5 percent in 2010—close to the level preceding the global financial crisis. Compared to pre-independence levels, life expectancy has doubled, infant mortality has dramatically fallen, smallpox has been eliminated, traditional scourges like leprosy and polio have almost disappeared, population growth rates have dropped by more than half, and there has been substantial progress in containing malaria and tuberculosis. At the same time, its challenges are immense. India is home to more poor people than any other single country. It bears a burden of disease out of proportion to its share of the world’s population, including an estimated one-third of diarrheal diseases and major nutritional deficiencies. India lags behind its neighbors in some basic health indicators such as access to clean water.

This report assesses the impact of U.S. engagement with India’s health sector in the past six decades. The United States’ involvement with health in independent India goes back to the

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1 Teresita C. Schaffer is director of the South Asia Program at CSIS. The author is grateful to experts in both India and the United States for their assistance in preparing this report. Dr. K. Srinath Reddy, president, Public Health Foundation of India, organized a roundtable of Indian experts on the health sector, which was probably our greatest single source of ideas and insights for this report. Madhavi Misra ably made all the arrangements for this vital event. Dr. Reddy also provided professional guidance and advice through the drafting process. Kerry Pelzman, Rajiv Tandon, Altaf Lal, Naresh Dayal, Dipa Nagchowdhury, Manmohan Lal Saxena, N.K. Ganguly, and Robert Bollinger all gave generously of their time to brief the author on different aspects of the U.S. experience with India’s health sector. Uttara Dukkipati, Olivia Dowling, and Lily Shapiro provided critical research support for the project. The judgment of all these people has been of inestimable value in preparing this assessment. Any errors in the paper are the author’s responsibility alone.

earliest days. The longest involvement is through the U.S. foreign aid program, which has worked primarily with the government of India. Other parts of the United States government have also been involved, chiefly the Centers for Disease Control and Prevention (CDC) and both the capacity-building and research activities of the National Institutes of Health (NIH). Private American institutions have been involved in India, including foundations, universities, and medically oriented businesses, as well as private Americans, including many of Indian origin. In at least one case, the recently founded Public Health Foundation of India (PHFI), both the American participants and the Indian institution represent public-private collaboration.

Our judgment about where the greatest impact has been felt draws on the experience of a number of observers from inside these organizations and the Indian institutions that work with them. Because of the unevenness of documentation and the extraordinary range of activities covered, we have not attempted to provide a quantitative metric, but have reflected the comments of those most familiar with the range of U.S. involvement in India’s health sector.

Creating institutions, providing scope for innovation, privileging relationships of professional equality, and remaining engaged for at least a decade were characteristics that showed up in most of the successful ventures. Short-term impact on health did not necessarily correlate with long-term impact on the health system. Perhaps the most encouraging observations, however, stem from the fact that the major participants in U.S. engagement with the health sector in India all seem to have contributed to the “crown jewels” of that experience. That suggests that the secrets to success are widely distributed in the U.S. public and private health establishment, and that as India’s economy and global footprint grow, this dynamic partnership should expand as well.

The Setting

The health sector in India provides services to 1.3 billion people with a per capita GDP of just under $1,000.3 About 27 percent of the population is considered “urban,” and this share will continue to grow. As in other poor countries, urban people are better provided for than their rural counterparts are. Life expectancy is 64 years nationally, but looked at state by state in India’s federal structure, it ranges from 55 in Madhya Pradesh to over 70 in Kerala. The measures of distribution of the most basic health services paint a very mixed picture. India lags behind its neighbors in the percentage of children who have received measles and DPT immunizations (67 and 62 percent, compared with between 80 and 90 percent for both Pakistan and Bangladesh).4 It does better than its neighbors in availability of skilled attendants at childbirth (50 percent, compared to 20-30 percent regionwide). Infectious disease represents a major focus for the health system, but the burden of non-communicable disease is rising, with diabetes and heart disease presenting a particular problem.5

From the perspective of India’s interaction with the United States, an especially interesting figure has to do with the role of the Indian government. About 4.1 percent of India’s GDP is spent on

5 Haté and Gannon, Public Health in South Asia, 8–9.
health, but less than 20 percent of this—about 1 percent of GDP, one of the lowest percentages in the world—comes from the government. Much of this private expenditure consists of out-of-pocket expenditures at the point of service.\(^6\)

At the same time, health policy is the responsibility of the government, and most of the U.S. involvement with the sector has been with the government. The government collects health statistics, runs most of the institutions that create capacity, and maintains official health facilities around the country. Most of India’s universities and research facilities are in the public sector. The American impact on India’s health sector in many cases runs through the Indian government. Making that impact felt beyond the government sector has not always been easy.

**Overview of U.S. Involvement**

**U.S. Agency for International Development (USAID)**

Health was a part of the U.S. assistance program in India from the earliest days. It was a relatively small portion of the U.S. assistance portfolio at the start, but has become a major focus for U.S. assistance. Since 2007, the area of child survival and health has accounted for more than half the USAID program for India.\(^7\)

USAID supported the development of community health workers in the Indian countryside in the 1960s, and the family planning program dates from that same period. Although food aid was not considered a health intervention as such, surplus U.S. agricultural products provided under P.L. 480 reached millions of people over the years, and U.S. agricultural assistance to the Green Revolution helped transform India’s capacity to produce enough basic food grains to feed itself, a major boost to its capacity to sustain a healthy population.

From 1971 to 1975, much of U.S. aid was cut off, the result of serious U.S.-India differences over the 1971 war with Pakistan that gave birth to an independent Bangladesh. During the state of emergency declared by Prime Minister Indira Gandhi from 1975 to 1977, the family planning program, especially in northern India, used forced sterilization to bring down the birth rate, leaving a legacy of suspicion that greatly impeded progress in family planning for years to come. USAID was able to remain involved in family planning, helping to ease fears and establish


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USAID officials regard the 1990s as the time when their most significant health interventions began. The traditional focus on population programs continued, but several new efforts were
added, notably on HIV/AIDS (through the President’s Emergency Program for AIDS Relief, PEPFAR); polio eradication; and the funding of basic data collection and analysis through the National Family Health Survey. As time went on, USAID’s emphasis shifted away from direct provision of services toward capacity-building and creation of systems. In some of these areas, such as HIV/AIDS prevention and family planning, USAID’s efforts increasingly focused on mobilizing non-medical people and tools to accomplish its goals in the health sector. These focus areas have left some of the most important legacies in India, as we will see.

Department of Health and Human Services

Various parts of the U.S. Department of Health and Human Services (HHS) have been involved in the Indian health sector for years. Their operations are decentralized and cover a wide range of activities. In FY 2008, HHS activities spent on the order of $30 million in India.

The major actors and the most important types of activities they carry out include:

- Centers for Disease Control and Prevention, which had its earliest and most famous success story in the early 1970s with the global eradication of smallpox, an enormous and complex operation whose last act took place in India and Pakistan. Its activities in India have chiefly involved building up health systems’ capacity and infrastructure, including laboratories, surveillance systems, and responses to pandemic diseases. CDC has also been deeply involved in HIV/AIDS prevention and control (through PEPFAR) and in polio eradication.

- The National Institutes of Health, which sponsor a wide variety of research activities with institutional partners in India, as well as research projects carried out by individual Indian scientists in partnership with American counterparts. In addition, India is the largest recipient of grants under the Fogarty International Center, intended to build up institutional ties between American institutions and Indian scientists. NIH also provides research equipment.

- The Food and Drug Administration (FDA), a recent arrival on the Indian scene, which now maintains offices in Delhi and Mumbai, not only to facilitate FDA inspections of food and drugs to be exported to the United States but also to work with its Indian counterparts to familiarize them with the procedures and standards in use in the United States.

- The Health Resources and Services Administration, represented in India by its International Training and Education Center, which works primarily on AIDS-related issues.

Private U.S. Involvement

Private foundations Groups like the Rockefeller, Ford, and MacArthur Foundations came to India decades ago and worked on a variety of different issues, many of them connected broadly to the problems of poverty and development. More recently, the Bill & Melinda Gates Foundation, which deals almost entirely with health, has become one of the major players on the health scene. It undertook operational projects, focusing in particular on the states of Karnataka and Andhra Pradesh and on partnerships with corporate entities like the Indian Oil Corporation (IOC) that were uniquely placed to reach populations vulnerable to HIV. The William J. Clinton Foundation
has also devoted most of its attention to health, but its focus has been more on streamlining the government’s procurement and other management systems.

*Universities:* A large number of U.S. universities are involved in India. Some use their own resources; others receive U.S. government grants for their India work, either operational or research. The Consortium of Universities for Global Health, a group of 20 U.S. and Canadian institutions founded in 2008, is active in India. Individual universities with a presence on the Indian health scene include Brown, Yale, Johns Hopkins, and Emory, and many others are either present or thinking of getting involved. In some cases there are university-to-university linkages; in others, individual universities have established their own programs.

*Indian-American organizations:* Private U.S. involvement in India’s health sector includes an increasingly prominent representation from the Indian-American community. Indian-American physicians, many of them affiliated with the Association of American Physicians of Indian Origin (AAPI), have established clinics or NGOs in different parts of India, some of them with strong links to the founder’s medical institution in the United States, others more or less free-standing.

*Business linkages:* Two types of business activities are likely to become more prominent in the future. The first is outreach to American patients from India’s high-end private hospitals (the Apollo chain is the best-known example, and the term heard in India is “medical tourism.”) They try to take advantage of the talent available in India at relatively low cost to attract patients from the industrialized countries, especially for elective operations that may not be covered by health insurance in those countries. The second kind of business connection is with India’s growing pharmaceutical industry. In the last five years, Indian pharmaceutical companies have been increasingly successful in obtaining FDA approval for their products, and this has enhanced their commercial presence both in the United States and elsewhere. India’s pharmaceutical industry is increasingly integrated with the multinational pharmaceutical companies, many of which have bought up Indian manufacturers of generic drugs in the past few years.

*Public-private—Public Health Foundation of India (PHFI):* This foundation, created in 2006, is one of the few successful examples of joint public-private funding in India. The foundation is in the public sector but has carved out a significant measure of autonomy in its effort to enhance training for the public health field in India. It maintains partnerships with some 16 U.S. schools of public health and with the Association of Schools of Public Health (ASPH) and has similar links to the top public health schools in Britain, Canada, the Netherlands, Belgium, and Australia.

The Legacy

The projects or activities most frequently singled out as stars in U.S.-India health collaboration fall into several different categories, reflecting the impressive variety of activities Americans have carried out in India. We will look first at a few projects that observers agree have had a particularly strong impact. These are by no means the only projects with lasting influence, but they illustrate well the kinds of collaboration that have stood the test of time:

1. Family planning innovations, specifically the State Innovations in Family Planning Services Project Agency (SIFPSA);
The National Family Health Survey (NFHS);

HIV/AIDS prevention and the work of the Bill & Melinda Gates Foundation’s Avahan project;

The collaboration among the Indian Council of Medical Research, the Johns Hopkins University, and the U.S. National Institutes of Health that gave birth to India’s National AIDS Research Institute; and

Disease eradication programs, especially of smallpox and polio, which generated great health benefits but had less of an impact on the health system as a whole.

We will then review the features that enhance the impact of foreign-funded projects, as well as the challenges of having a lasting impact on the health system in India.

**State Innovations in Family Planning Services Agency (SIFPSA): Promoting Innovative Models for Family Planning**

Starting in 1993, USAID provided $350 million in funding over a 10-year period for a program intended to develop new models of local family planning systems, concentrating on the state of Uttar Pradesh, India’s largest state and one that was consistently among the lowest two or three on social indicators and governance. It was also one of the states where the government of India had asked the United States to focus its health and family planning work. The funding flowed from USAID, to the Indian central government, to SIFPSA, an agency created under state government authority but with close links to NGOs. During the 10 years of the project, SIFPSA developed a number of procedural models for making bilateral donor funding to state governments more effective. It also launched several pathbreaking new collaborations with NGOs, including important partnerships with organizations outside the health system, such as dairy cooperatives and other community organizations, reflecting the fact that the kinds of grassroots changes in health behavior that India’s health policy wanted to encourage were not strictly medical.

Statistics gathered by the Population Council noted a striking increase in the use of modern contraceptive methods other than sterilization by married women in Uttar Pradesh during the project period, from 5 percent in 1992 and 6 percent in 1998 to 21 percent in 2000. Looking back on the project, senior Indian health officials underlined its success in producing innovative ideas and its work in helping to bring its most promising innovations to scale. They noted that the National Rural Health Mission, the basic framework for public health policy of the current Indian government, had adopted several of the models developed by SIFPSA. They stressed that the project’s willingness to fund the basic staff of the organization gave the agency the energy and flexibility to push their innovations forward. At the same time, the health managers for the state found themselves in difficulty when the project concluded because, without the project, they

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lacked the funds to pay for the relatively well-paid project staff—the classic downside to direct staff funding.9

National Family Health Survey: Information and Management Systems

In 1992, the government of India agreed to launch the first National Family Health Survey. This large-scale survey, fully funded at the outset by USAID and carried out by the International Institute for Population Sciences, gathered a wealth of data on fertility, mortality, family planning, maternal and child health, and other related subjects in 24 states and Delhi. The objective was to provide a data-driven basis for health policy and to provide early warning of emerging health and family welfare issues.

According to officials familiar with the project, the Indian government embarked on this venture with some trepidation, concerned about the implications of such detailed data leaving the country and worried that this kind of surveillance could become a kind of “gotcha” game that would put India’s performance in a bad light. The first survey, however, provided information that the government found extremely valuable, concerning gaps in immunization coverage that contrasted with other government statistics. Similarly, the NFHS figures on malnutrition led directly to government intervention in this area.

Two surveys have been carried out since then, in 1998–1999 and in 2005–2006. With each successive survey, the government of India has provided a larger share of the financial support, and the surveys have brought in financing from a variety of official and foundation donors from around the world. Both the data collection and the analysis need to continue to improve, but knowledgeable observers regard it as the best instrument of its kind in India. And in at least one case it has brought policymakers good news. The third NFHS provided the basis for revising downward India’s estimate of the prevalence of HIV infection, and it validated the strategy adopted by both the government and some of the prominent international donors of concentrating AIDS control efforts on high-risk population groups.

Besides providing important information, the survey has now become one of the regular institutions of health policy management in India. The Indian government “owns” it—it is no longer looked on as an aid project with India as a “recipient.” India’s health data are increasingly transparent as a result—a plus for India but also for the world. USAID’s sponsorship of the NFHS has built an institution and helped create the underpinnings of a vital tool for the managers of India’s health system. Nearly two decades after the initial intervention, the relationship among the Indian and foreign scientists involved in this operation is one of collegiality.10

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9 Public Health Foundation of India, workshop on U.S. engagement in India’s health sector, New Delhi, March 2010; website of SIFPSA, http://www.sifpsa.org/.
Private Foundations: Management Models and “Scaling Up”

Private foundations have the advantages of enormous flexibility and the freedom to define problems as they see fit. Each foundation has its own operating style and priorities, and several have made significant contributions to the health sector in India.

The Gates Foundation’s Avahan project for AIDS prevention was launched in late 2003, and in a remarkably short time it had established itself in Delhi and six other states with high HIV prevalence—areas with a combined population of 300 million. The program brought in substantial resources. Its initial five-year, $200 million commitment made it the single largest external donor to India’s AIDS program. Subsequent commitments have brought total funding up to $338 million.

From the start, the program’s managers have focused on developing a model that could be replicated and that intervened at strategic points in the HIV transmission process. The program has five principal activities, but the central ones are prevention among high-risk groups—including sex workers, their clients, truck drivers, and injecting drug users—and capacity building. Gates Foundation publications refer to India’s AIDS pattern as not a single epidemic but multiple local ones. The thrust of the Avahan approach therefore is to create a basic approach that can be readily introduced in many different settings, with local managers creating whatever variations are needed on a strong, centrally driven model.11

Avahan has a strong monitoring and evaluation component and collects detailed data on project activities. It is difficult to assess the full impact of the project on the epidemic, or to distinguish between this program and other interventions taking place at the same time. The program’s website states that sex workers in Avahan areas are more likely to use condoms and that the incidence of sexually transmitted diseases has decreased. What is clear is that this program has developed a remarkably successful approach to starting quickly, scaling up, and keeping track of the project’s direct activities. It has also produced a very effective operational research organization, facilitating lessons learned both within and beyond the organization. Its staffing is unusual: a high percentage of the early project leaders came from a business or business consulting background and were looking for an idealistic outlet for their organizational skills. The foundation’s private character probably made it easier to focus relentlessly on developing a good basic model and on scaling up: at the end of the day, it could walk away, in ways that a government agency cannot.

The MacArthur Foundation illustrates both an impressive record in scaling up and another valuable but somewhat uncommon characteristic: the willingness to take up projects that others find politically or otherwise risky. The MacArthur Foundation has made a series of grants in

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India, one of their “focus countries” for Population and Reproductive Health, in the area of adolescent reproductive health and sexual education. In a country where about half of women marry before the legal age of marriage (18), and where social mores strongly discourage candor about teen-age sexual behavior despite fairly good evidence that teens are taking risks that would horrify their parents, young people are clearly a critical audience for messages about reproductive and sexual health. Since 2007, the MacArthur Foundation’s website lists seven projects, most of them multiyear, in this area. It is too early to talk about impact, but it is striking that the MacArthur Foundation’s website and its Delhi-based staff speak of scaling up in terms quite similar to the Gates Foundation, and have been trying to develop a model for bringing pilot projects to larger scale.\textsuperscript{12}

**Creating Self-Sustaining Institutions**

In 1992, six years after the discovery of the first documented case of HIV infection in India, the Indian Council of Medical Research (ICMR) created the National AIDS Research Institute (NARI) in Pune. Much of the initial staff came from the AIDS cell at the National Institute of Virology. Within about a decade, the new institute had an international reputation and a research portfolio that established it as an international player.

This was the result of a remarkable partnership among ICMR and the NARI scientists, a team of scientists from the Johns Hopkins University who worked with them, and the National Institutes of Health, which provided most of NARI’s research funding in the initial years. The Hopkins/NARI team applied for competitively awarded NIH research grants and managed to win an impressive number. Figures compiled by the leader of the Hopkins team indicated that NARI was substantially more successful than its counterparts in other developing countries in winning grants from NIH in which Indian scientists were co-principal investigators and that led to a large number of research publications with NARI scientists as “first authors.” In other words, the research money was not “aid funding.”

Today, the NARI website lists an imposing number of international linkages and joint research projects. NARI now receives more funding from outside of NIH than from NIH itself. NARI scientists serve on expert panels for India’s National AIDS Control Organization and for NIH. The early scientific teamwork and NIH funding built up strong collegial ties among NARI, Johns Hopkins, and NIH, but NARI is in no sense a satellite of its early backers. After about 15 years, the Indian government made a major investment in expanding NARI. While NIH remained a prized partner and funding source, its share of the NARI research agenda diminished as other funders came in.

Whether or not this had been the original intention, the NIH funding wound up serving as a strategic investment in Indian research and in long-term research capacity. It is NARI’s self-sustaining character, together with the fact that its research funding now comes from all over the world and its scientists are internationally recognized, that ensures its lasting impact on the Indian medical scene. These same qualities also give its scientists a seat at the table when India

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makes policy in their area of expertise. This example illustrates the power of excellence and strategic investment sustained over an extended period, a power that is magnified when it is grounded in mutual professional respect rather than the giving and receiving of aid.\textsuperscript{13}

NARI is not the only institution that showcases these characteristics. Observers familiar with U.S.-India collaboration have cited the Tuberculosis Research Centre in Chennai, a series of research grants between the Indian Council of Medical Research and Boston University, and several decades of sustained U.S. investment in filaria research in India to illustrate the same point. The longest-lasting linkups between U.S. universities and Indian counterparts are built on the same kind of collegial respect that characterized the NARI/Hopkins relationship.\textsuperscript{14}

Capacity-building grants from the Fogarty International Center have been particularly useful in building up institutions that have a lasting impact. As previously noted, India has obtained more of these grants than any other country. They build up research capacity, but they also develop continuing professional ties that benefit scientific work in both countries. Former Fogarty grantees have held some of the most important positions in the Indian health establishment. When combined with lab-to-lab linkages and the electronic access to the NIH library that has become possible in the last few years, the result can be a major advance in the ability of Indian scientists to make the most of the skills they already have.

\textbf{Disease Eradication: The Smallpox Campaign}

Measured by its direct impact on health, the most dramatic success story in half a century of U.S. support for India’s health sector was the eradication of smallpox. The global effort, begun in 1966, started out badly both worldwide and in India. It was under-resourced, with WHO expenditures on the order of $78,000 for the entire first seven years of the effort.\textsuperscript{15} In 1974 the number of smallpox cases in India peaked at 188,003—86 percent of all cases worldwide! The following year, remarkably, India was declared smallpox-free. These findings were confirmed two years later by an independent scientific committee.

The final push came in a campaign in which American institutions, particularly CDC but also USAID, played a leading role, working intensely and intimately with the government of India, community health care workers, and other international organizations, notably WHO and several European organizations. Their methodology for eliminating smallpox relied on a scientific breakthrough—a freeze-dried vaccine that eliminated the need for a cold chain (the system used to keep vaccines refrigerated so that they will retain their potency at the end of the distribution network)—and a surveillance system that made it possible for eradication teams to swoop down on individual outbreaks promptly and vaccinate the surrounding population according to

\textsuperscript{13} Website of the National AIDS Research Institute (NARI), http://www.nari.icmr.res.in/; author’s conversation with Dr. Robert Bollinger, April 22, 2010, and subsequent correspondence.

\textsuperscript{14} Author’s conversation with Dr. Bollinger; website of TRC Chennai, http://www.trc-chennai.org/; conversation with Dr. N. K. Ganguly, former director, ICMR, November 2009; Public Health Foundation of India, workshop.

carefully developed protocols. The teamwork and institutional linkages that achieved such dramatic results carried on for decades.

The eradication of a disease is possible only under very special circumstances, when the biology of the disease, the technical and scientific tools available to fight it, the surveillance systems necessary to track it, and political will all coincide. But when it works, as it did in this case, the result is remarkable, often described as one of the greatest boons for human life that science has produced. Only two other diseases are spoken of today as potential candidates for elimination: polio and guinea worm.\(^\text{16}\) Success against smallpox has encouraged the United States and India to work together on polio, with some success. The magnitude and focus of the goal has made possible an unusual degree of interagency cooperation in both countries.

At the same time, the smallpox campaign highlights some of the classic pitfalls of international health cooperation. It was a top-down effort, directed by the World Health Organization. Fortunately, it had absorbed some of the lessons from previous unsuccessful disease eradication programs and had abandoned, for example, the one-size-fits-all organizational and management model that plagued the international malaria effort (in India and elsewhere). But it stands as the classic example of a “stovepiped program,” established as a self-contained organization inside both the Indian and the international health systems. This type of organization can help provide a sense of urgency and focus, and in this case, once it got up steam, the international effort worked amazingly fast. But stovepiping made it more difficult to transfer lessons learned from the smallpox and polio campaigns to other parts of the health system. And while the top talent migrated to other parts of the health establishment in India and maintained their collegial links with international scientists, the mid-level and local staff that worked on the program do not seem to have provided a boost to the system in a more general way. In short, smallpox eradication unquestionably benefited health by eliminating a massive health scourge from India and from the world. It did not have an enduring impact on the health system.

What Works?

These “crown jewels” of the U.S. involvement in India’s health sector are at first glance remarkably diverse. Some were carried out by the government, some by the private sector. Smallpox eradication provided a direct health benefit; the other four examples involved changes in the working of India’s health system. None of them was without flaws, but all left India’s health system stronger, and all left a legacy of good will between Indian and U.S. health managers and health scientists.

A few characteristics recurred in many if not most of these examples:

- **Long-term engagement:** In each of these cases, the public or private sector experts from the United States were involved on a sustained basis over many years. This makes it possible to build up trust among the Indian and American participants, to understand in depth the problems being addressed, to observe with care the early stages of a project, and to build up

gradually the local funding that will eventually have to supplant most of the foreign resources. The Indian government’s practice of directing foreign aid donors to concentrate on one or two states over an extended period—in the case of the U.S. family planning effort, Rajasthan and Uttar Pradesh—has enhanced the impact of U.S. assistance to those areas, because it obliged the U.S. project staff to develop an intense and granular familiarity with the areas where they were working. The way that U.S. assistance programs are funded makes time a precious and vital resource. U.S. aid is funded by one-year appropriations. All these examples make clear that while one can get an important job started in a year, the chances of being able to evaluate it within a year, much less achieve self-sustaining status, are practically nil. To have an impact, one needs to be persistent and flexible—and one has to be there for years.

- **Innovation:** Every one of these projects rewarded innovation. SIFPSA was set up for the express purpose of encouraging innovation. The others were not, but were set up in such a way as to provide space for innovation. Even the smallpox eradication program, which started by working off a predetermined template, was not successful until it had embedded mechanisms for change into the program. Openness to innovation is important for its own sake but also because it attracts more creative scientific and management staff. It is perhaps especially important in a country the size of India, which is composed of thousands of micro-environments that may need to be managed differently from the standard national model.

- **Institutions and models:** Three of the “crown jewels” involved creating institutions: NARI, Avahan, and the National Family Health Survey. One, SIFPSA, was designed to find new ways for institutions to work. The smallpox eradication program did not create an institution that outlasted the actual eradication effort—and, significantly, this is the reason some observers argue that it failed in its larger goal of making the Indian health system more responsive. Once they have taken root, institutions can outlast a particular leader or even a particular government. If they embody values that are central to a successful health system—scientific excellence in the case of NARI, data and surveillance in the case of NFHS—their impact will continue long after the founders have left, be they local or foreign.

- **Donors vs. colleagues:** All but one of these programs were carried out in the context of an aid program, but virtually all were run as collegial undertakings. The strongest example of this is NARI, and more broadly the research institutions that were created in part through research funding from the United States. This raises the stature of the institution locally. Just as important, it will bring to the institution U.S. collaborators who are as interested in learning as in sharing their own knowledge.

- **Local ownership:** Perhaps the most important characteristic of all is that the participating institutions need to have a local commitment behind them. Interestingly, this was not always the case at the start of a collaborative relationship. The National Family Health Survey was funded entirely by the United States at the outset; likewise, NARI’s initial research budget was overwhelmingly funded by NIH. But in both these cases, the project developed strong local backers, and local funding followed. All these successful projects had champions in both India and the United States who were determined to keep them going and make them self-sustaining.

There are also a few classic pitfalls worth noting:
Withdrawal symptoms: The SIFPSA project benefited greatly from USAID’s willingness to fund staff costs. It paid a price for this later on: when USAID funding was withdrawn, finding the funding to pay for the staff that had been funded by the United States was a challenge. This is an even bigger challenge in cases where a foreign aid donor provides salaries out of keeping with local pay scales. Avoiding all salary funding is probably not the right answer, but finding the right “glide path” toward ending foreign funding is important—and tricky.

The price of success: Especially in a resource-short economy, a local institution’s success can crowd out future innovations. One example: the public-sector pharmaceutical company in India that began producing vaccines quickly became the primary supplier to the government vaccination program. In later years, the same company resisted introducing a new vaccine that would have benefited the program but that they did not yet make.

Getting out of the box: In a number of these successful projects, the Indian and U.S. scientists and other project staff developed close professional relationships that continued after the Americans had gone home. It proved more difficult, however, to develop similar bonds across bureaucratic or disciplinary lines in India. The case of NARI was especially interesting. The institution’s leadership recognized the value of integrating scientific with social science research, and in the middle of the last decade took in a visiting social scientist to try to fill this gap. It proved exceptionally difficult to do. This problem is certainly not unique to India—one hears the same complaint from research institutions in the United States and elsewhere. But breaking out of various kinds of categories is one of the challenges medical scientists face.

One final observation: while this paper has analyzed success and long-term impact in terms of institutional goals and methods of operation, the people involved matter. Institutions can outlast weak leadership, but it takes the right kind of leader to manage change or create an institution. In each of these cases, there were Indian and American participants passionately committed to the outcome, willing and able to create powerful professional partnerships, and willing in some cases to step over or around bureaucratic obstacles. What they created is not without flaws, but it is a legacy of their vision and their hard work, at both a personal and institutional level.

It is fitting that at a time when people in Delhi and Washington are speaking of building up a U.S.-India partnership that fits the challenge both countries face in the twenty-first century, our joint involvement in India’s health sector reflects vital contributions from both the government and private institutions. That is likely to be the hallmark of the U.S.-India relationship of the future, even more than in the past.