Meeting Report

Boston-India Symposium:
Essential Interfaces in Public Health

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Boston University
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Boston-India Symposium:
Essential Interfaces in Public Health

Meeting Report by Madeline Drexler

Introduction

Poised to become the world’s most populous nation by 2030, India is on the verge of a public health revolution. Under the administration of Prime Minister Manmohan Singh, the country’s leaders have committed themselves to an ambitious mandate: creating new academic centers, scaling up health care delivery and building an inspired public health workforce. “In the last two years, something extraordinary has touched India,” said Maharaj Bhan, M.D., Secretary of the Department of Biotechnology, in the Ministry of Science and Technology.

On October 22 and 23, 2007, four universities with longstanding academic ties to India convened an international meeting in Boston, Massachusetts to support this unprecedented dynamism. “Boston-India Symposium: Essential Interfaces in Public Health” gathered scholars, professionals and students in public health, medicine, business, communications, technology, policymaking, international relations, and other areas to explore both the vast potential and possible pitfalls of India’s new public health vision.

The Symposium’s goal was to bring together top-tier academics, administrators, innovators, and key government stakeholders to address two issues: How can U.S. academic institutions connect with their Indian counterparts to promote the application of public health knowledge? And what can U.S. academics learn from Indian colleagues that would make American initiatives more relevant in solving global public health problems?

To answer these questions, the Symposium’s presentations revolved around four “interfaces” that must function smoothly in order to foster creative and effective public health actions. These are:

- the interface of knowledge generation and knowledge application in international health
- the interface of public health research and health policy
- the interface of knowledge and product development
- the interface of health research and management of health care delivery

By exchanging experiences and ideas, Symposium participants paved the way for lasting partnerships between institutions in India and the U.S. As many participants noted, this is a golden opportunity for such collaborations. India’s democratic leadership has committed itself to change and openness in building its knowledge economy. The country’s private sector is eager for outside partnerships. And India’s large, educated and globally-aware young population is ready to make these goals a reality. Indeed, a fifth essential “interface” became obvious during the conference: the interface between leading public health professionals in India and the U.S., and the engaged students who will soon enter the ranks. Many of these students produced the
Symposium’s 34 posters – on topics ranging from air pollution in Delhi to heavy metal contamination of Ayurvedic medicines sold on the Web.

As many speakers noted, the benefits of international exchange flow in both directions. For its part, India can take lessons from America’s tradition of academic rigor and public health expertise. “When I travel to the U.S. these days, I am neither looking for resources nor even for collaborative projects. I am just hungry to learn more about how you created excellence in this country in the educational system, in the scientific system and in your public health system,” said Bhan. “Some of the best ideas about what is good for primary health care in India come from our friends overseas.”

Conversely, the U.S. can study India’s success in providing low-cost health care to a large and diverse population. “They have figured out how to take care of communities as well as to take care of the people,” said Harris Berman, M.D., Dean of Public Health and Professional Degree Programs at the Tufts University School of Medicine. “They do population medicine as well as curative medicine in the same settings, using the same people. There is much in their model that can apply not just to the developing world, but to the developed world.”

Added Gerald T. Keusch, M.D., Associate Provost for Global Health at Boston University: “We live in a globalized world. We need to understand what development – and health, as an issue in development – is all about. We need to expose our students to views from other parts of the world.”

By the end of the two-day meeting, participants had forged new ties and a tangible commitment to continue the dialog – not only between countries, but within cities. “My take on the theme is the epigraph to E.M. Forster’s Howard’s End, which is ‘Only connect,’” said Barry R. Bloom, Ph.D., Dean of the Harvard School of Public Health. “A lot of people in this room are connected to India. A smaller number are connected to each other in Boston. One of the signal achievements has been to get us … connected with each other.”

Those connections may someday alter the public health landscape. “Science discovers, technology develops and public health delivers,” said K. Srinath Reddy, M.D., President of the Public Health Foundation of India. The Boston-India Symposium prepared the ground for all three.

**Health Conditions in India**

Since its founding as an independent nation in 1947, India has steadily improved its population health. Life expectancy has doubled; infant mortality has dropped by half; severe malnutrition has decreased; and a new health care system has, despite many problems, eradicated smallpox and guinea worm, and has greatly reduced the number of people infected with leprosy, malaria and polio.

Yet India remains sharply divided in health status and access to care. Endemic poverty and disease cloud the picture. India still lags behind many neighboring Asian countries in life expectancy, infant and under-five mortality and the prevalence of HIV and tuberculosis.

In other words, the “epidemiological transition” – which posits that increasing affluence in a population shifts the causes of death from infections to non-communicable diseases – only partially applies here. “Epidemics still occur. Starvation deaths still occur,” explained V. I.
Mathan, M.D., Ph.D., the Indian Council of Medical Research (ICMR) Chair of Epidemiology at the National Institute of Epidemiology. “We have, on the one hand, a rich lifestyle and emerging health consciousness – and, on the other hand, enormous social inequities with which only the public health care system can contend.”

India’s 2005-2006 National Family Health Survey, released in 2007, underscores these disparities. Women are bearing fewer children; for the first time, more than half of currently married women are using contraception; and estimates of HIV prevalence have sharply declined. Yet only half of women see a health provider at least three times during their pregnancy, as recommended; among women who have been married, 40 percent have experienced physical or sexual violence; and while infant mortality has dropped, fewer than half of children 12-23 months receive all standard vaccinations.

Broader divergences also abound. While life expectancy in politically progressive Kerala is 73 years, in the central Indian state of Madhya Pradesh it is under 59 years. While the number of people with a primary education has doubled since 1961, for many, yearly income has not kept pace. While anemia has increased overall in adults – presumably from undernutrition – overweight and obesity are becoming more common in cities and among the highly educated. And while prompt access to tertiary care is easy for some, most Indians lack health insurance and many become impoverished in a medical emergency. As V.I. Mathan observed, “India is not one country.”

Envisioning the Future

Challenged by the scope and complexity of India’s public health picture, the Symposium’s speakers highlighted four priorities where international collaborations and partnerships would help fulfill the nation’s new ambitions. These priorities are:

- an expanded cadre of health workers who are both technically specialized and community-based
- educators to train this next generation of public health professionals
- business collaborations to nurture new kinds of enterprise
- scaled-up health care delivery that builds on best practices and innovative interventions

More broadly, these priorities fell under the rubrics of People, Knowledge, Institutions, and Health Care Delivery – themes that the Symposium’s speakers returned to again and again.

People:

Until recently, India has failed to invest in its public health workforce. Today’s frontline professionals are not only inadequate in number, but also lack the breadth of skills needed in the 21st century. Put simply, India must train more public health employees, fill the gaps in certain specialties and encourage men and women to work across disciplines.
According to Maharaj Bhan, most of India’s educational institutions create “monotypic” graduates with one type of expertise. But “solution science,” he said, requires individuals with a mix of talents, “these fascinating people who walk through spaces.”

At the same time, however, India does desperately need particular experts who are crucial to the public health mission. According to Bhan, “When I speak to the head of the biggest biotech company in India, she tells me: ‘I can’t find toxicologists.’ The pharma people are saying, ‘Where are the medicinal chemists?’” Other experts in short supply: epidemiologists, biostatisticians, clinical investigators, social scientists, health economists, and policy researchers.

To this end, Indian officials must determine what kinds of specialists are needed, in what numbers, and in what locales. “Our thinking at the moment is: We don’t want individual success or brilliance,” Bhan explained. “We want the system and the enterprise to function and eventually deliver good public health.”

Knowledge:

In a burgeoning knowledge economy, India will need applied research, pedagogical tools and shared intellectual discourse to revitalize its public health mission. Among its knowledge priorities:

- a strong evidence base for public health interventions
- within-nation research collaborations
- international academic partnerships

According to Vasan S. Ramachandran, M.D., Professor of Medicine at Boston University School of Medicine, public health in India suffers greatly from the “know-do” gap. That is, evidence-based policies and interventions fail to be implemented. As a result, much of health care is based, not on objective evidence, but on empirical practice.

India’s new public health mission highlights applied research. But such research is rarely rewarded in the academy. “Practice-based research I’ve heard called uninteresting, unimportant, unexciting. I’ve heard it called second-class. It’s not fully acknowledged as a legitimate piece of the research enterprise,” said Jon Simon, D.Sc., Director of the Center for International Health and Development at the Boston University School of Public Health.

To raise its legitimacy, Indian universities must reward and promote applied research. In addition, said Simon, such investigations must be program- and policy-relevant. “We need to ask our research collaborators: Who is the policy client and who is the technical client for the research you want to do?”

Enriching India’s public health education also means sharing knowledge across disciplines. Bhan envisions short-course programs where physicians can quickly master practical aspects of public health, basic science, technology, and government regulation. He also

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foresees a flow of technical expertise between the academy, industry and regional innovation centers – “translational capacity in basic science institutes, and science capacity in translational institutes.”

One model of educational exchange comes from the Tufts University Sciences Knowledgebase (TUSK), a knowledge management system that uses the internet to hold discussions, deliver curricula, exchange research and house low-cost digital libraries of content that can be shared across disciplines, institutions and countries. In a similar vein, India’s expanding knowledge enterprise will draw on ties with universities abroad; Christian Medical College, in Vellore, for example, is one partner in the TUSK network.

Through e-learning platforms, “We can link the best in practice and the best in research,” said Jeffrey K. Griffiths, M.D., M.P.H.&T.M., Director of the Global Health Concentration at the Tufts University School of Medicine’s Public Health program. TUSK’s repository of faculty-vetted information and its teeming discussion networks, he noted, have created “communities of practice, where people have the advantages of global lessons they can apply locally, with culturally sensitive methodologies.” One recent electronic conversation – between students in India, the U.S. and Uganda’s Makerere University – explored the fact that sanitation is linked to female literacy in India, that many girls drop out of school because of lack of toilet and water facilities, and that literacy is tied to far-reaching public health goals. The discussion ranged from the biology of waterborne pathogens to lessons in cultural competency – a process that brought essential interfaces into the virtual classroom.

Institutions:

The backbone of India’s research and interventions will be new institutions of higher learning. Among the nation’s institutional priorities:

- creating schools of public health dedicated to high-quality scholarship
- drawing on the untapped capabilities of medical schools to conduct community health research
- building government research institutions and national centers of excellence

With 20 percent of the world’s population, India has only one-third as many universities as South Korea. Moreover, India’s colleges and universities are often too isolated to spark intellectual synergy. “Institutions are located far away from each other. They are functionally disconnected. And they are often physically located in a way that connectivity becomes difficult,” said Bhan.
The Public Health Foundation of India (PHFI) is taking aim at these problems, with an explicit mandate of institution-building: launching five to seven new schools of public health within the next six years, all while assisting the growth of existing public health training departments. According to PHFI President K. Srinath Reddy, India’s universities can play a pivotal role in improving the public’s health. “If a medical college or an academic institution does not own up to any social responsibility for the health states of its neighboring community, then it’s totally dissociated from its very purpose. It cannot remain an ivory tower institution, only training academic researchers and teachers.”

In the public sector, the Indian Council of Medical Research is also developing several new Schools of Public Health (ICMR-SPH), oriented initially to physicians in government service who are responsible for population-based health services but have little training in public health. At the National Institute of Epidemiology, in Chennai, these physicians will learn core public health skills. ICMR will then tap its existing network of categorical research institutes and their field-based research settings to train students in specific public health competencies. ICMR – a part of the Department of Health Research, within the Indian government’s Ministry of Health and Family Welfare – can also channel research funding to priority areas of public health, generating the evidence base needed to guide long-term decision making.

Yet according to V.I. Mathan, this will not be a simple task. “There is a lot of starry-eyed optimism of what can be done to improve the situation in India,” he said. “I’ve been a health care professional in India for over 50 years, involved deeply in health education, government policy matters, government research, and in public health. I think that unless we realistically look at the reality on the ground … there will be rapid disappointment down the line.”

Rural areas present the most serious hurdles, he added. “We have to challenge young people with the rewards, the privileges and the satisfaction of working in the rural areas.” Over time, however, urban health issues will become equally important as populations continue to relocate to large cities in India and elsewhere.

Both of these new public health efforts need extra faculty, whether newly-minted MPH’s or researchers asked to devote time and energy to teaching public health. To help these novice academics develop their teaching skills, Boston University School of Public Health, in collaboration with PHFI and ICMR-SPH, is developing a “Teach the Teacher to Teach” program. Tailored to the ways that students actually learn, it draws on technology, leadership training and on the principles of assessment and evaluation.

Clearly, medical colleges must align their recruitment and research with national and local health priorities. “There is no reason why a medical college cannot provide information about the prevalence of hypertension in the neighborhood community, why the department of obstetrics cannot provide pregnancy-related hypertension estimates, and why the biochemistry and clinical medicine departments could not talk about the comprehensive risk profile of people with hypertension,” Reddy said. “With standardized methodology, it could be done in 20 or 30 medical colleges across the country. And it could provide a profile which could be replicated five years down the road by a different cohort of postgraduates, demonstrating time trends.”

ICMR’s field epidemiology training program has been instructing cohorts of medical officers to conduct outbreak investigations of newly emerging and re-emerging infectious diseases. Now, as part of the new ICMR Schools of Public Health effort, and connected to ICMR’s national surveillance system, the program is well-positioned to develop and deploy a network of public health medical officers. In an outbreak emergency, this cadre of officers will be able to rapidly
identify the pathogen, inform health officials, investigate the epidemic, and intervene to limit its spread and impact.

India’s colleges and universities can also produce world-class research through academic collaborations, supplying evidence for policy-making and technical expertise for program design and evaluation. But Reddy conceded that all these roles are “too big a bite” for medical colleges alone. Fortunately, new research institutions have been launched or are in the pipeline. Among these: the National Health System Resource Center, which will channel technical support to the rural health mission; the Translational Health Science and Technology Institute, collaborating with Boston University, which will carry out preclinical and clinical trials, along with product development; and the Health Science Technology Center, collaborating with MIT, which will conduct multidisciplinary research and training, linked to India’s regional centers of excellence.

**Health Care Delivery:**

In India, health care delivery is a two-sided proposition. While the nation promotes high-tech medical tourism, poorer citizens can suffer financial ruin by seeking medical care. And while states like Kerala have impressive life expectancy figures and infant mortality rates, other states confront deep-rooted disease. Among India’s health care priorities:

- innovative and scaled-up health care delivery to the majority of the population
- expanded health care in rural areas
- optimal balance between public and private systems of care, benefitting populations in need

One of the greatest challenges to India’s public health mission is the sheer size of the country. India needs not only more frontline workers, including those from the community, but also more health management specialists to scale up programs. “I have never understood why a thousand managers cannot be thrown into the public health system of India,” said Bhan. “If health care delivery is a disaster, it is because the value of innovation has been grossly underemphasized.”

India also faces stark differences in quality of treatment and access to services. Medical care can come from the government system, voluntary health care schemes, not-for-profit plans, corporate hospitals, private practices, indigenous health care, and medical tourism. Approximately three-quarters of the population relies on private medical care. But because the number of public sector medical colleges is insufficient for the need and the demand, a host of private medical colleges have sprung up, charging very high tuitions. Doctors in the private sector, in turn, often order expensive technologies (for which they are paid a percentage) to earn back their education expenses. Private sector health care also lacks quality assurance and government regulation.

Some observers contend that the private health care sector isn’t the enemy. “Hammering away at the elite institutions is a bit like Don Quixote tilting at windmills,” said Tarun Khanna, Ph.D., Professor at the Harvard Business School. “There is a mistaken premise that if we did not allow elite health care, those doctors would be reallocated to the poor sections. That’s completely fallacious: They would simply leave and go to the Middle East, or they would show up in my back yard in Boston … The solution is more: How do you augment the supply of trained technicians, trained doctors, and data to cater to the middle income and the lower-income populations?”

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- Tarun Khanna
Khanna described one such program: Narayana Hrudayalaya, translated as God’s Compassionate Home, a state-of-the-art private tertiary heart hospital in Bangalore that rivals leading American heart care facilities in both the size of its staff and number of surgeries it performs. The hospital, Khanna said, is “an unlikely example of entrepreneurship.” Its founder, Devi Prasad Shetty, M.D., was inspired to help as many heart patients as he could without turning anyone away. “My ambition,” Shetty explained, “is to cure the poor of the world for less than $1/day. This is the Walmart-ization of healthcare.” Treatment for impoverished clients – about 40 percent of surgeries are performed below cost or at no cost – is subsidized by the full fees paid by wealthier clients.

But Gita Sen, Ph.D., Professor at the Indian Institute of Management, Bangalore, noted that subsidy-based solutions are not always successful. Most private hospitals, she said, receive substantial government subsidies, on the mistaken assumption that they will provide a proportion of their services to the poor. For Sen, the overriding question is: “What is the right public/private mix for India at this time?”

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**The Promise of Partnership**

In a world where the old boundaries have shifted – between nations, between academic disciplines, and between research and commerce – India will be a proving ground for new products and forms of collaboration. Among these:

**Silk Sensors:**

Silk, one of the traditional symbols of India, may soon become one of its most high-tech products. David Kaplan, Ph.D., Chair of the Department of Biomedical Engineering at the Tufts University School of Engineering, has perfected methods to chemically transform the structural proteins in silk into new materials with useful properties for many applications. Using reverse engineering, he has created fibers, sponges, films, and biologically dynamic lenses.

Silks are “the strongest, most robust materials in fiber form produced in nature,” he said. These properties make the silk from silkworm cocoons perfect natural organic, environment-friendly materials for uses in health care and broader materials applications. With his colleague Fiorenzo Omenetto, Ph.D., Associate Professor in the Department of Biomedical Engineering at Tufts, Kaplan has transformed this traditional fiber into a new “silk-based sensor platform technology” that may someday be used to manufacture the kind of low-cost color-readout sensors urgently needed in India: to test for bacterial spoilage in foods, contamination of a water supply or the stability of pharmaceuticals.

**New Entrepreneurs:**

At the Institute for Technology Entrepreneurship and Commercialization (ITEC), at the Boston University School of Management, India represents rich terrain for future business partnerships. Executive Director Jonathan Rosen, Ph.D., says many of these joint efforts will be forged by today’s “New Entrepreneurs” – who reach across industries, markets, cultures, languages, and political and economic barriers. Such “entrepreneurs without borders,” as Rosen calls them, are uniquely suited to build sustainable and socially responsible enterprises that could solve major problems in public health. BU students, for example, can earn an MBA with a concentration on entrepreneurship in health care.

ITEC is holding more discussions in India about prospective ventures than in any other nation, hoping to identify young businesspeople who want to improve local health conditions. ITEC is exploring several partnership agreements to stage business plan competitions.
Among the products that have come out of ITEC’s collaborations with other developing nations are inexpensive technologies such as warming beds for newborns, products well-adapted to local cultures and resources. These inventions spring from “organic resourcing,” said Rosen: “Go to the places where you have the problem, see what’s available, and find the solution based on those available resources.” He added that, surprisingly, “A lot of these new medical technologies are appropriate for applications in advanced care settings as well.” Rosen foresees a wave of collaborations where both sides benefit: host countries such as India benefiting from new technology, and the U.S. benefiting from start-up companies’ subsidiaries.

GlobalCures:

India is also an auspicious place to carry out translational medicine – that is, research that tests a hypothesis in humans, in a process uniting bench science, bedside testing and large-scale trials. Among India’s compelling attributes for such research: strong information technology, a diverse population, the capacity for rapid clinical trial enrollment, and low expenses for both drug manufacturing and clinical trials.

One of the new enterprises hoping to capitalize on these qualities is GlobalCures, a not-for-profit medical research organization based in the Boston area. “We want to lead a worldwide effort to test the clinical efficacy of therapies that have scientific merit, but whose financial reward might be uncertain. We want to make this a very open institution,” said the company’s co-founder, Vikas Sukhatme, M.D., Ph.D., Professor of Medicine at Harvard Medical School. GlobalCures will initially focus on cancer, assessing generic drugs, foods, herbs, and supplements with the goal of producing affordable medicines. “You don’t just have to copy what’s going on in the West,” said Sukhatme. “You can try new things that are adapted to India’s needs – and, in fact, teach the West from what you learn.”

Model Institutions

As these issues and questions shape India’s national conversation, a number of institutions – some longstanding, some brand new – may serve as models:

Achutha Menon Center for Health Science Studies (AMCHSS):

AMCHSS is the health sciences wing of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, located in Kerala, the Indian state with the nation’s best health indicators. The MPH program was initiated in 1997, and is now supplemented by Ph.D. programs in epidemiology, health economics, health policy, and health systems. Over its first ten years, AMCHSS has graduated over 100 students with masters degrees, 40 percent of whom have entered government service.

AMCHSS grew out of a mission of education, research and contribution to public policy. It gathers health data from the community, leverages the local public health infrastructure to carry out interventions, and requires students to conduct practical research projects. In India and

The AMCHSS, a pioneer in public health education in India, has graduated 100 MPH students in its first ten years. Entering students (left) represent a broad range of specialties; a high proportion of graduates (right) obtain placements in government service, as well as international organizations and academic posts.

Image: Vasan Ramachandran
abroad, the university has collaborated with other public health institutions, medical schools and entities such as the World Health Organization. AMCHSS trains students in the critical core skills needed to carry out public health and follows a philosophy of learning by doing. In their dissertations, students generate testable hypotheses backed by fieldwork. One recent dissertation analyzed the prevalence of dental fluorosis in a district where well water was high in fluoride; the project led to a government program that removed fluoride from the wells. “That, my friends, is public health at its best,” said Boston University’s Vasan Ramachandran, a cardiovascular epidemiologist and Professor of Medicine working at the Framingham Heart Study, who helped establish AMCHSS.

The school started with a faculty of five. “There’s a Yiddish word: chutzpah. That’s what it means when you start a school of public health with a core faculty of five,” Ramachandran quipped. Today, there are seven faculty, augmented by visiting scholars from within India and abroad. Faculty interests include tobacco cessation and control, sentinel health monitoring, vector-borne infections, cardiovascular disease surveillance systems, gender and social issues in reproductive health, and medical ethics.

Christian Medical College (CMC):

Located in Vellore, in the southern state of Tamil Nadu, CMC focuses on the cultural milieu of medical care. “The journey in this context has been learning from people, talking to them in their language, and slowly transforming communities,” said J.P. Muliyil, M.D., Ph.D., Principal and Professor in the school’s Department of Community Health.

CMC’s hospital has 2,000 beds and treats 4,500 outpatients daily. Covering a population of 300,000 – in rural areas, an urban slum and a tribal enclave – its emphasis is on public health. Over the years, the college has tracked key health indices in its target population, from immunization coverage and institutional deliveries to perinatal mortality and geographic information system analyses of health trends. “There are some elements of primary health care. Lots of emphasis on socioeconomic development of the people, mainly the women. A good dose of family medicine. And ongoing health systems research,” explained Muliyil. Residents deliver babies, perform C-sections, conduct minor surgeries – “because that is what India needs.”

In the experience of Christian Medical College, Vellore, improving trends in areas such as institutional newborn deliveries and immunization came with strong efforts to educate the local community. Infant mortality rate in the served area has improved markedly in the last 20 years.

Image: J.P. Muliyil

CMC requires medical students to spend several weeks training in a village, and urges graduates to work for two years in a rural hospital. In these environments, students often encounter traditional beliefs, such as the notion that measles is caused by a visiting goddess. Carrying out the best practices of public health while acknowledging such customs becomes an act of patience.
and creativity. According to Muliyil, “We realized that the cultural context of health and disease is more important than the biomedical model.” A testament to the school’s success: 66 percent of graduates stay in India.

**Indian Clinical Epidemiology Network (IndiaCLEN):**

In 1996, shortly after India’s Pulse Polio Program started, the IndiaCLEN network emerged – built from the individual Clinical Epidemiology Units established by the Rockefeller Foundation in the 1980s through its International Clinical Epidemiology Network, or InCLEN. IndiaCLEN was created for researchers within India to more effectively interact and apply the principles of clinical epidemiology and objective evidence to local health care problems. “Research of this kind is the only way to improve public health interventions,” said Ashok K. Patwari, M.D., Senior Program Consultant at INCLEN.

IndiaCLEN’s research and training programs are channeled through seven government medical colleges and hospitals, as well as leading non-government hospitals such as CMC Vellore, thus spotlighting health care needs of the underprivileged. Today, the network embraces 139 organizations, including government, funding agencies, health care research institutions, and clinicians as consumers of the evidence generated by IndiaCLEN’s research. Over the last decade, the IndiaCLEN Program Evaluation Network, a collaboration with the Center for International Health and Development at Boston University, has worked on 11 evaluation projects, ranging from an assessment of emerging infections to a multicenter study of family abuse against women. For the Pulse Polio Program, IndiaCLEN recommended clear, simple health messages and client-friendly service delivery. A study for the World Bank, which assessed injection practices, found that 74 percent of immunization injections used unsafe practices. In response, the Indian government promised to introduce auto-disable syringes for its Universal Immunization Program.

**Public Health Foundation of India:**

Launched in 2006, the Public Health Foundation of India (PHFI) is sowing seeds for the future. Its charter: to establish five to seven new schools of public health over the next six years, three of them to open by 2009. With the aim of fashioning a diverse workforce, these schools will enroll students from a variety of backgrounds, not just medicine or public health.

PHFI has four primary stakeholders: the Indian government, civil society organizations, national and international academia, and industry leaders. “Our research agenda must stretch from
molecules to markets,” said PHFI president K. Srinath Reddy. “Our arena of action and advocacy must move from risk factors to rights.”

PHFI’s founders were spurred by the lackluster state of India’s public health education. While medical colleges rapidly proliferated between 1981 and 2006, most are of indifferent quality, and only eight schools impart a public health education. Each year, India, with a population of 1.1 billion, produces only 375 graduates of these public health institutions; by contrast, the U.S., with a population of 300 million, annually produces 5,900 public health graduates.

Beyond institution-building, PHFI plans to establish a strong national research network with international partners, and to generate policy recommendations. According to PHFI President K. Srinath Reddy, enlightened public health policy should be evidence-based, financially feasible, cost-effective, sustainable, and politically viable. “Science would be sterile without social relevance,” he said. “And policy would crumble on clay feet if it were not erected on an edifice of strong scientific evidence.”

**Indian Council of Medical Research School of Public Health**

The ICMR is the equivalent of the National Institutes of Health in the U.S., with 26 Institutes and Centers and many field research projects around the country. Its National Institute of Epidemiology (NIE) – established in 1999 in Chennai – quickly developed a field epidemiology training program for outbreak investigations, as well as a Masters of Applied Epidemiology in conjunction with Sree Chitra Tirunal Institute of Medical Science and Technology, in Kerala.

With the successful implementation of this program, NIE began to develop plans to open a series of Schools of Public Health. Today, new facilities have been built and student enrollment has begun, with an M.P.H. degree to be offered by Sree Chitra. Focusing initially on medical officers in government service, the program will cultivate the professional breadth and depth needed to better promote district public health. The curriculum has been developed in collaboration with international partners, including the Boston University School of Public Health. As it says in the mission statement for the ICMR School of Public Health:

“Our research agenda must stretch from molecules to markets. Our arena of action and advocacy must move from risk factors to rights.”

- Srinath Reddy

“Partnership is the cornerstone of public health training. ICMR is looking for the experience and expertise of the international schools of excellence. These international schools are looking for exposure to developing country problems and field experience.”
Research Gaps

With more calls for evidence-based interventions, two key areas of Indian public health currently require more targeted research:

**Gender and Health:**

Gita Sen, Ph.D., Professor at the Indian Institute of Management, Bangalore, described a dearth of data about how women’s roles in society shape their health. “There is a great refusal among those who work in poverty and inequality issues in health to acknowledge the importance of gender,” she said. Yet gender affects everything from alcohol and nicotine consumption to the effects of unemployment on health to use of medical services. Sen has therefore called for disaggregating health statistics by sex, and more broadly for changing gender imbalances in both the content and process of health research.

She noted that women are both less likely to complain about illness and less likely to seek treatment – a pattern especially pronounced among poorer women. “It’s not lack of awareness, because people know about illness,” she said. “It’s actually lack of acknowledgment. And this tends to be a major reason for the non-treatment or discontinuation of treatment for women.”

Indeed, when Indian men fail to seek treatment or halt care, it’s usually for financial reasons; for women, it’s because they won’t acknowledge that they’re sick. According to Sen, “The women said: ‘It wasn’t serious enough. I didn’t think it was serious. The family didn’t think it was serious. I couldn’t go. I had other things to do.’” Fortunately, studies show that assigning male-female pairs of health interviewers to separately talk to men and women helps elicit the women’s hidden suffering.

Sen has also looked into the effects of early upbringing on adult disease. Starting in infancy, girls in many parts of the country have fewer government entitlements to nutrition and health care. Does this differentially affect girls’ health? Do their bodies adjust physiologically, or do the effects accumulate over a lifetime? Such concerns undermine the current government policy of supplying iron supplements only during pregnancy – while calorie, protein and micronutrient deprivation may occur much earlier in girls’ lives. According to Sen, “We need to significantly strengthen the nutritional component for girls in the 7 to 14 age group, if we are to break the back of low birth weight and neonatal mortality, not to mention the health of the mothers themselves.”

**The Aging Population:**

An impending population shift also highlights India’s need for better public health data. According to David Bloom, Ph.D., Professor of Economics and Demography at the Harvard School of Public Health, India’s aging population – partly the result of improved health and longevity – portends “a huge demographic upheaval.” Over a period of 50 years, beginning in 2000, the growth rate of India’s 50-and-over population is projected to be seven times higher than that of the under-50 group.
The trend will put enormous demands on the health care system, where only 10 percent of the population has health insurance. The burden will weigh even more heavily because of social changes in India: faltering family support for the elderly because of mobility among the younger generation and because women are working outside the home; declining fertility rates; couples having children at a later age. “What we have here is a perfect storm,” said Bloom. “It’s leading to a diminution – perhaps a sharp diminution – of family support for elderly parents.”

India has a thin evidence base for understanding these issues. Bloom believes that the country must be brought into the group of nations that conduct and analyze, on a regular basis, surveys of the population who are approaching retirement age or are already retired. Such surveys can collect information on biomarkers and physical and mental health, as well as economic and social data.

“Right now, policy debates related to population aging and the elderly are taking place in a complete evidence vacuum,” he said. “For India’s sake, it would be good to fill that vacuum with meaningful and relevant information.”

Think Locally, Connect Globally

Defying today’s conventional wisdom, Maharaj Bhan told the audience: “I disagree totally with this notion that we should think globally and act locally. The answer is to think locally and connect globally.” Such a motto could also serve as the distilled wisdom from the Symposium. In India and abroad, essential interfaces in public health will be catalysts for change.

But change won’t be easy. “This is my problem with all international participation in India: It wishes to serve but it also has the dangerous potential to disrupt,” warned Bhan. “Each one of us is capable of coming in with these focused interventions: ‘my niche, my program.’ Nothing drives me to craziness more than this does … When you enter in there, make sure you fit yourself into the ecosystem. It takes time, it takes patience.”

“My take on the theme is the epigraph to E.M. Forster’s Howard’s End, which is ‘Only connect.’ A lot of people in this room are connected to India. A smaller number are connected to each other in Boston. One of the signal achievements has been to get us… connected with each other.”

- Barry Bloom

Many hurdles could threaten today’s ethos of partnership: National pride, scientific sovereignty, intellectual property issues, technical and cultural challenges, as well as India’s persistent burden
of disease. All of which puts a premium on mutual respect. “Ultimately, it’s going to come down to openness, trust, flexibility – frankly, the things that have been in short supply in many places,” said Boston University’s Jon Simon. “It’s going to come down to humility and willingness to work with colleagues with grace and with style, to establish mechanisms by which to do international collaborative work.”

Ideally, such collaborations will nurture a generation of public health activists in India. According to Simon: “Public health research is really about creating the social change necessary to improve the health of populations. We don’t need research scientists – we need activists. And we need public health activists who are hanging out in universities and are dressed up in academic clothes but are really committed to the social change dynamic central to the public health mission.”

Added ICMR’s V. I. Mathan: “We need public health researchers who are activist based on evidence. Not on high moral ground or on a political basis – on evidence.” Such evidence-based social change has been partly responsible for the stellar health indicators of Kerala. The state boasts a high female literacy rate – and female empowerment translates into lower infant mortality and lower child mortality. Kerala also guarantees access to health care and promotes equity in the distribution of goods, income and land.

“It’s very nice to talk about the dissemination of knowledge, setting up schools of public health,” said Vasan Ramachandran. “But it’s very important to acknowledge that the majority of the determinants of public health probably lie beyond the schools of public health and beyond health care services themselves.” Or, as Maharaj Bhan concluded, “We’ve got to deal with equitable social development. We’ve got to deal with more inclusive politics … India’s biggest failure is this inequity that we’ve learned to live with and get comfortable with.”

These ideas inspired not just the seasoned professionals in the audience, but also the students – many of whom had left India to study in the U.S. Throughout the Symposium, younger people flocked around the Indian representatives, asking for advice and seeking to make connections. For many, it was the first time in their fledgling careers that they felt needed and welcomed in their home country.

“My friends, and my friends’ friends, are in public health, and they want to go back,” said Samatha Panati, MPH, a research associate at the Boston Public Health Commission. Panati, who hopes to specialize in health sector reform and health systems research, has recently decided to return to India – partly because of what she observed at the Symposium. “The country is ready,” she said. “This is the time.”

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