

Innovative Responses to the Healthcare Challenges Confronting India

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Introduction

Is India's healthcare system keeping pace with India's rate of economic growth? Opinions vary, but the general consensus is that India's health system, while not falling behind, has to accelerate its reach, depth, and quality to avoid becoming an anchor on continued economic growth. There is, of course, a parallel question: To what extent can access to quality care be available to citizens of all socioeconomic levels? These universal and perennial questions are not unique to India but have a special urgency in the rapidly developing nation because progress in healthcare availability and health equity – or the lack thereof – will accelerate or deter growth as well as determine the future of political leaders.¹

This chapter seeks to lay the groundwork for this book by elucidating the broad spectrum of challenges to the Indian healthcare system, and in turn their impact on society and the economy. The underlying purpose of the chapter, however, is to explore some of the creative approaches to addressing these challenges and to stimulate further innovative thinking into each of the challenges confronting India.

Healthcare goals of India

What are the key goals of healthcare in any country? The World Health Organization, the Institute of Medicine, and others have enumerated these goals in many ways in varying lengths (see Figure 1.7). They can be summarized as follows:

1. Improved health of the population as measured by life expectancy and other measures of wellness
2. Pooled risk sharing by the population, perhaps in conjunction with government programs to allow financial access to care, as well as to avoid catastrophic ruin
3. Provided care at some level of shared access, that is, equity for all citizens²

Many studies have assessed India's progress on these goals quantitatively and qualitatively.³ Of these studies, the *India Health Report* provides not only the most comprehensive recent analysis, but also an insightful historical perspective that couples healthcare and economic growth and explains their relationship in great detail.⁴

Healthcare access has been a major component of the Indian mind-set since before independence. Seven major landmarks illustrate this consciousness:

- The Health Survey and Development (Bhore) Committee of 1946 espoused that no individual should fail to secure adequate medical care, curative or preventive, due to inability to pay. There should also be special arrangements for vulnerable sections of the population such as mothers, children, and the mentally impaired.
- These sentiments were then memorialized in the Constitution of India (1950), which, in Article 41, established that "The State shall, within the limits of its economic capacity ... make effective provision for ... public assistance in cases of ... old age, sickness and disablement, and in other cases of undeserved want."
- India further ratified the Alma-Ata Declaration of 1978 in its position that "The existing gross inequality in the health status of the people ... within countries is politically, socially and economically unacceptable."
- This concept was captured in 1983 in the first official National Health Policy, which emphasized primary care, system decentralization, community participation, and a larger role for the private sector.
- Under the Millennium Development Goals (2000), India made commitments to reduce child mortality, improve maternal health, combat HIV/AIDS, reverse the incidence of malaria and other diseases, and ensure environmental sustainability by 2015.
- In 2002, the second National Health Policy reiterated the country's vision but acknowledged the limits of capacity.
- Finally, in 2009, the central government drafted the National Health Bill for the legal system to recognize a right to health and healthcare with due consideration to social determinants of health, that is, the social, economic, and political circumstances that affect the health of individuals and populations.⁵

These landmarks represent the ideals of Indian society. They are largely unfulfilled. To the extent that progress has been made, it has been a combination of some movement in the public sector on the one hand and aggressive innovation and investment by the private sector on the other. Government intervention for the “bottom of the pyramid” has been in the form of insurance programs (see Chapter 10). There has been additional effort by non-governmental organizations (NGOs) and entrepreneurs who have experimented with novel double and triple bottom-line ventures, that is, venture capital funds that seek not only financial but also social returns on investment (see Chapters 11 and 12).

Economic impact of the state of health

The adage “Wealthy is healthy, and healthy is wealthy” can be applied to India in full measure.⁶ It is only within the last two decades that economic analysis has begun to regard health as an economic factor, although the connection was intuitively obvious much earlier. The foundational work of Preston noted the strong positive relationship between per capita income and life expectancy at birth, and thus the key role of economic development in boosting health status (see Figure 1.4).⁷ Why? It is a function of standards of living and financing of healthcare infrastructure. Higher incomes are linked to higher levels of education, literacy, and healthy behaviors. In addition, an increased ability of a population to pay for health services serves as an incentive for more people to enter the health professions and for more hospitals, both public and private, to expand their service, scope, and reach. Patients as consumers also demand a higher standard of care, especially in a society (such as India) where roughly 70 percent of health expenditures are paid out of pocket, and perhaps another 10 percent is financed by insurance (a portion of which people pay for directly).

The economic consequences of ill health are magnified in a developing economy, especially when social safety nets are still evolving in their own right. Full-time employees and dayworkers alike must work to get paid. “Sick leave” remains a luxury of the developed world. In 2010, the loss in household income due to ill health amounted to at least 1 percent of India’s GDP.⁸ The lack of risk sharing extends to life insurance as well. When an income-producing family member succumbs to illness, there is no insurance to offset the loss of income.

We should ask the question: what is a healthy workforce and how does it relate to economic growth? A healthy workforce can be characterized by the following factors:

1. Physical and mental well-being that allow workers to focus on the tasks at hand with attention to productivity, quality, and workplace safety
2. Longevity that maximizes the investment in training and development
3. A minimum of absences related to illness of the workers *or* of a family member who needs the attention of a worker at home
4. Confidence that the cost of care will not be financially ruinous or require the worker to seek multiple sources of employment
5. An overriding sense of fairness and the opportunity for advancement or other recognition

These characteristics are classically a function of plain and simple good management of people at work. There is, however, a significant health component underlying each of these factors. Regardless of whether health insurance is the responsibility of the employer, companies can exert considerable political influence to move national and state governments to (a) enact types of universal coverage or new laws designed to generate the creation of insurance – public or private – as well as (b) ensure minimum standards of quality and service. Governments and business can also set standards for what is taught in schools and marketed to the public to promote health.

Healthy workforces are associated with higher productivity, greater profits, more robust tax revenues, higher GDP, and more competitive nations. For a developing economy, the impact of health is far greater because the social and organizational capacity to absorb the loss of a worker or income earner is far less or even nonexistent.

A positive spin can be put on these observations. Improvements in health, such as those reflected by life expectancy at birth (LEB), may have the potential to enhance any state's economic performance. Studies suggest that a 1-year increase in life expectancy is associated with increased economic output. To put a finer point on it, if Uttar Pradesh were to have Kerala's LEB (nearly 15 years greater between 1995 and 1999), the state's output could potentially be 17–47 percent higher than prevailing levels.⁹ These observations speak to the need for a national sense of urgency to address the gaps that exist in healthcare.

The public face of the healthcare system

The public face of the Indian healthcare system has different roles for the central government and the individual states. The central government of India addresses health policies, regulatory matters, and disease control and prevention. The states address healthcare and the training of personnel. The Ministry of Health and Family Welfare (MoHFW) in the central government has several functional departments: Health Services, Family Welfare, Health Research, and Traditional Medical Systems. The state ministries typically have departments of Medical Education and – similar to the national ministry – Health Services and Family Welfare. Noteworthy is the fact that neither the national or state ministries have public health departments (except for Tamil Nadu).¹⁰ Despite this large infrastructure and attention to need, the public sector only finances about 30 percent of healthcare spending (e.g., by providing care services through public hospitals and community clinics).¹¹ The balance of care is provided by private hospitals and practitioners, many of whom have public duties and private practices.¹²

Challenges in healthcare

India's transitioning demographics (see Chapter 1) have a significant impact on the current state of health affairs, and will play an even more profound role over the next quarter century. While India is a relatively young society whose youthfulness will provide a significant comparative

advantage for the country, the absolute number of citizens who are aged is increasing dramatically. Furthermore, economic opportunity and employment mobility for younger Indians are beginning to have the same effect as in the West, most notably in the US: multi-generation households have been eclipsed by two-generation nuclear family units. Traditionally, the elders of a family could rely on younger generations to provide for their needs. While the younger generation continues to provide financial support, the hands-on care offered from child to parent is waning. There is also the phenomenon of declining fertility, which typically accompanies a rise in the standard of living and economic opportunity for couples of child-bearing age. Ultimately, however, this will affect the age pyramid by leaving fewer young people to provide for the elderly. India will experience such effects later than western countries, China, and Japan (see Figure 1.6). Nevertheless, although it will be felt gradually, the impact will be magnified when superimposed on the already-challenged healthcare system.

These factors compound the present state of affairs. In January 2011, *The Lancet* presented a profound series of articles and commentaries on the state of health in India and the nation's present and future healthcare challenges. The themes of the articles can be summarized as follows:

1. *Continuing burden of infectious diseases.* The variety and associated burden of infectious disease is still crippling despite the advancements made in vaccine-related prevention and therapeutic intervention. There are implementable innovations that can alleviate the problems in the short and long run.
2. *Reproductive and child health and nutrition.* While steady increases have been documented in maternal and child health (see Chapter 1), the pace of improvement is slow. Possible explanations exist in social inequity and the differing role and resources played by and distributed among Indian states. There is room for innovation in planning, resource allocation, infrastructure, oversight, and monitoring.
3. *Chronic diseases and injuries.* The headlines on health in India generally focus on infectious disease.¹³ Despite the urgency of intervention in this category, chronic diseases – such as cardiovascular, mental health, diabetes, and cancer – as well as injuries are actually the leading causes of death and disability. In most states, prevention strategies have not been implemented, and, as a national matter, more leadership and a political commitment are needed.
4. *Healthcare human resources.* Given the rapidly growing demand for health services, juxtaposed against an underserved set of needs even prior to India's growth, there is a shortage of trained and certified health workers throughout the country, particularly in rural areas (see Chapter 3). This set of circumstances is likely a result of underinvestment and lack of training facilities, along with antiquated laws and regulations related to the bounds of practice for different categories of health workers. There is room for significant innovation in addressing these needs.
5. *Healthcare finance.* The issues associated with the financing of healthcare are all encompassing. They address facility creation, expansion, and improvement on the one hand, and human resource capacity on the other. Of course, there is a third hand: the ability of

families and individuals to pay for services as discrete events or, preferably, through more universal approaches to risk pooling. There are certainly innovations in public finance as well as private-sector solutions to these problems.

6. *Access to care and health equity.* The impact of all five categories above is revealed in the problem of access to care for the many and general standards of health equity for all. Health equity is at once local and global. Locally, it is a matter of citizens of a country to have at least minimum access to needed care at acceptable levels of cost and quality. Globally, it is a matter of transferring techniques, products, and technology, access to which requires the greatest degree of innovation.

The Lancet series offers one of the most coherent and thorough analyses of these factors yet published and provides a provocative framework for this chapter. The six themes are abstracted, and in some places supplemented, by observations in the *India Health Report* or cross-referenced to other chapters in this book. For each theme, this chapter describes (a) the situation, (b) some innovative interventions, and (c) the business and organizational challenges represented.

Continuing burden of infectious diseases

The situation

The variety and severity of infectious diseases in India are unnecessarily large. Malaria, tuberculosis, filariasis, visceral leishmaniasis, leprosy, HIV infection, vaccine-preventable childhood diseases (only half of India's children receive the prescribed jabs, despite the fact that India is the largest producer of vaccines in the world – see Chapters 13 and 14),¹⁴ and a host of other insect- and waterborne diseases still contribute 30 percent of the disease burden in India as measured in disability-adjusted life years lost (DALYs).¹⁵ The economic impact of this disease burden is enormous, especially in terms of lost labor and national and personal expenses. Another consequence is an overloaded public hospital care network that must address the primary care needs of infected patients. This, in turn, promotes the growth of largely unregulated private commercial healthcare providers that require and consume significant out-of-pocket payments from the population.

This public health gap exists because members of the medical profession and their professional associations do not value public health. This lack of appreciation is manifest in the way public health is taught (or not taught) in medical colleges and, provocatively, the overemphasis on biomedical interventions overshadowing the contribution of social determinants of infectious diseases. Epidemiology and health economics have become research disciplines inadequately linked with the health system in central or state governments.¹⁶

Innovative interventions

The traditional interventional approach – a national government program for each disease, or “vertical” – expanded to all infectious diseases is likely to be neither effective nor cost-efficient.

The country needs to reorient its health policy to broader disease control, specifically the creation of a “functional public health infrastructure that is shared between central and state governments, with professional leadership and a formally trained cadre of personnel who manage an integrated control mechanism of diseases in districts for infectious and non-infectious diseases and injury.”¹⁷ Such an approach would facilitate case-based surveillance and allow public health response at the district level.

Business and organizational challenges

The formation of an integrated national/state public health system with a business focus on control and prevention represents a new category of costs for the government and presumes engagement with private care facilities. These costs, however, may be offset many times by the savings accruing to the public hospitals and the individuals affected. Historically, in other countries, public health policies and laws have had to achieve a balance with personal privacy and civil liberties. In a nation with a complex and highly charged system of polity, it is good to ask probing questions regarding the implementation of a national surveillance system, including: is the timing right for India to undertake such efforts? These are open questions that can be addressed via a concerted effort by a national think tank or commission.¹⁸

Reproductive and child health and nutrition

The situation

India has the world’s greatest burden of maternal, newborn, and childhood deaths. In 2008, 1.8 million children under 5 years (including 1 million neonates) and 68,000 mothers died.¹⁹ India also has the greatest number of undernourished children. Progress in reproductive health and child health and nutrition does not compare favorably with other Asian countries that gained independence at the same time as India.²⁰ The pace of improvement has been slow and falls short of the national and Millennium Development Goals. The reasons are multiple and complex: one conclusion is that “coverage for priority interventions remains insufficient, and the content and quality of existing programs suboptimal, further complicated by unacceptable inequities.”²¹ This harsh assessment is based on hard data.

There are several explanations for maternal and child mortality as well as malnutrition and low birth weight. Hemorrhage, sepsis, complications of abortion, and hypertensive disorders are the leading causes of maternal death; in children under the age of 5, more than half of deaths are caused by various infections, prematurity, and birth asphyxia. The remaining deaths are due primarily to pneumonia and diarrhea. Undernutrition is a contributing factor in about half of all deaths.²² The immediate causes of poor reproductive health, child health, and undernutrition have underlying social, economic, and environmental determinants: literacy, women’s status, sociocultural beliefs, caste, taboos, and (above all) income level.²³

Innovative interventions

A multidimensional strategy is needed to improve reproductive and child health. The process must begin with strengthening the health system's essential components such as policy, finance, human resources, supply chain management, nature and provision of service offerings, and management information systems. To remedy the inconsistency of policy formulation and administration, direct stewardship must be instituted by the government: specifically, the establishment of a board with the authority and resources to address these fundamental health issues. The problems of consistent administration are a special challenge across the 640 or more districts of India, each of which is a distinct civil administration.²⁴ On average, each district has a population of 1.8 million. District management is necessarily decentralized, but consistent standards and resources can be coordinated through the National Health Systems Resource Centre.²⁵

Since 2005, the Janani Suraksha Yojana ("Safe Motherhood Scheme") cash transfer program has encouraged pregnant women to have institutional deliveries. The demand generated by the program raises questions about quality and related factors that must be examined over time. Incentive programs can be beneficial provided that monitoring and assessment are built into the planning.²⁶

Business and organizational challenges

Researchers in public health cannot help but be passionate about their work and its implications. Their proposals for change and improvement must be abetted by input from policy-makers and attention by the private sector; the needs are too great to be met by government intervention alone. It is a useful exercise to look at several initiatives and explore the roles of institutions beyond the government. A few programs are summarized in Figure 2.1. Among the conclusions that can be drawn from the history of these programs is that there has been a steady trend toward integration of purposes and strategies, ultimately brought to a focus in the National Rural Health Mission (NRHM). As cited in the table, however, only a modest improvement in infant mortality rates has been observed. Such programs have not yet been successful in alleviating the imbalance between health infrastructures in subcenters and those in primary health centers. This begs the question whether the government can be expected to fulfill its goals without the involvement of other entities, such as private-sector health facilities and services. The state of Gujarat, by way of example, has shown that public-private partnerships can increase access to delivery in institutions and emergency obstetric care:

The Government of Gujarat, by recognizing the shortage of obstetricians in the public system in rural areas, and at the same time their presence in the private sector in nearby towns, developed an innovative partnership by providing childbirth and emergency obstetric care in private hospitals under the care of qualified private obstetricians free of cost to families but paid by the government.²⁷

Figure 2.1: Interventional Programs for Maternal and Child Health Over the Last 40 Years.

Established	Program	Purpose	Strategy - Goals	Progress/Outcome	Issues
1960s–70s	Family Planning	Disseminate information and services for family planning and population management	Community health workers assigned to villages; fragmented approach	Integrated into ICDS	Country did not take a comprehensive view of the needs of communities, outreach programs and facilities; low political visibility and low spending
1970s–80s	Immunization	Promote vaccination			
1975	Integrated Child Development Services (ICDS)	Provide supplementary nutrition, non-formal education, immunization check-ups and nutritional education	Provide services at a village center – Anganwadi – the worker monitors growth of children and provides supplements and guidance	Over 7000 projects serving nearly 90 million beneficiaries provided through 1 million Anganwadi centers; steady increase in fund allocation	Despite center activity, results not encouraging; little or no association between presence of ICDS centers and nutritional status. Existence still has potential
1992	Child Survival and Safe Motherhood Programme (CSSM)	Combine interventions for immunization, control of diarrhea, acute respiratory infection, Vitamin A and newborn care	Approach to integrate needs	Integrated into CSSM	Modest impact on infant mortality; not yet successful in alleviating imbalance between health infrastructures in the sub-centers and primary health centers
1997	CSSM and Family Planning merged to form Reproductive and Child Health Programme (RCHP)	Bring together interventions for child survival and maternal health	Shift emphasis to births in institutions and emergency obstetric care as key intervention strategy	Integrated into the HRHM	
2005	National Rural Health Mission (CSSM integrated into NRHM)	Increased investment in public health, improvements in health systems and focus on communities, decentralization and demand side intervention	Goal to deploy 750,000 new health workers, 47,000 auxiliary nurse midwives and 27,000 new nurses; establish 450,000 village health and sanitation committees	Demand for public health facilities has increased. Positive effect on ante-natal care, institutional deliveries and immunization	

Source: Adapted from Vinod Paul, Harshpal Sachdev, Dileep Mavalankar, et al. "Reproductive Health and Child Health and Nutrition in India: Meeting the Challenge," *The Lancet* 377(9762) (2011): 333.

The government has successfully negotiated acceptable fees and the model is readily replicable in other states.

Chronic diseases and injuries

The situation

There are numerous new challenges to the public health of India. High among these are shifts within the spectrum of communicable diseases, and increasing prevalence of noncommunicable and chronic diseases.

So, for instance, while smallpox has been eradicated from the country and polio and cholera are on their way out, chest-related diseases (pulmonary tuberculosis, acute respiratory infections, pneumonia, diarrhea, and malaria) now account for the maximum fatalities through communicable diseases ... The particular vulnerabilities of Indians of all classes show up in the rising incidence of ischemic heart disease, diabetes, strokes and cancers ... These diseases are also arising earlier in life which has implications for social as well as economic costs.²⁸

There are several special characteristics about chronic illness in India that distinguish the country's disease burden. First, there is a younger age of onset. Second, there are certain risk factors not found in the West, such as indoor air pollution. Third, the conventional risk factors have been propelled by the country's large-scale urbanization, industrialization, globalization, and aging population.²⁹

As established earlier, roughly 70 percent of India's healthcare costs are paid out of pocket by patients. The proportion of noncommunicable diseases in household out-of-pocket health expenditures rose from 31.6 percent in 1995–96 to 47.3 percent in 2004. These direct costs totaled about \$9.1 billion in out-of-pocket spending, accounting for roughly 3.3 percent of India's GDP. The total burden of chronic illness on the economy is significant, ranging as high as 4–10 percent of GDP.³⁰ The clinical and economic burden is not confined to urban areas:

Most chronic diseases are equally prevalent in poor and rural populations, and often occur together. Although a wide-range of cost-effective primary and secondary prevention strategies are available, their coverage is generally low, especially in poor and rural populations. Much of the care for chronic diseases and injuries is provided in the private sector and can be very expensive ... India has already passed the early stages of a chronic disease and injury epidemic; in view of the implication for future disease burden and the demographic transition that is in progress in India, the rate at which effective prevention and control is implemented should be substantially increased.³¹

Of the estimated 10.3 million deaths that occurred in India in 2004, 1.1 million (11 percent) were due to injuries, 4 million were due to communicable diseases (39 percent), and

5.2 million (50 percent+) were due to chronic diseases.³² Data from the following year corroborate these figures and suggest a decline in the share of deaths caused by communicable diseases (to 36 percent) and a rise in the share accounted by chronic diseases (to 53 percent).³³ All of the data point to cardiovascular disease as the number one killer among chronic illnesses; cancer is also a major driver. Indeed, Delhi has the world's highest incidence of gall bladder cancer among women; Wardha has the highest incidence of mouth cancer.

There are behavioral factors and other social determinants contributing to this alarming trend. For example, smoking prevails in over one-fifth of the population (with rural inhabitants smoking more than their urban counterparts, and young people increasingly adding cigarettes to their lifestyle). Urban dwellers compensate by having far less physical activity. Overall, low physical activity accounts for trends in obesity and consequent diabetes and other associated complications. Alcohol consumption is also on the rise. Indoor air pollution is a significant health risk factor for 80 percent of the population that still uses solid fuel for cooking, a particular hazard in the rural population.³⁴

Research indicates that greater than 20 percent of the population has at least one chronic disease and over 10 percent of Indians have two or more. People under 45 years of age are also affected. The emerging pattern in India is characterized by an initial uptake of harmful health behaviors in the early phase of socioeconomic advancement. This brings changes in diet, increased exposure to traffic injuries, and other new exposures.³⁵

Innovative interventions

In the West and in Japan, fully two-thirds to three quarters of all healthcare costs are consumed by patients with five or more concurrent chronic diseases. Such patients are not necessarily the elderly, so that the cost is carried by both national health systems and private parties. The difference is that in these other countries, insurance systems dominate the financing of healthcare costs, a subject taken up below. Beyond insurance intervention to tackle the potentially catastrophic financial impact of healthcare costs on patients and their families are the interventions for prevention and management of risk factors. By way of example, cardiovascular and respiratory diseases are presaged by tangible risk factors such as high blood pressure, high body mass index, high blood glucose and cholesterol, and tobacco use. Related interventions, naturally, are directed at the population as a whole as well as individuals with high-risk profiles. These interventions range from diet and lifestyle training to (when indicated) aggressive use of medicinal prevention strategies, such as medications for high cholesterol, hypertension, and diabetes.

Figure 2.2 illustrates the tangible steps taken by the Indian government over the decades to address problems of chronic disease, sensory loss diseases, and injuries. The programs are comprehensive.

Business and organizational challenges

The principal challenge with respect to chronic disease and injury in all societies is to provide care at a cost that will neither undermine the national economy nor bankrupt households.

Figure 2.2: National Policies for Chronic Diseases and Injuries in India

Focus	Policy or Program	Year of Launch	Focus of Activities
Cancer	National Cancer Control Programme	1975	Primary prevention of cancers by education, especially about the hazards of tobacco use and the necessity of genital hygiene for prevention of cervical cancer; secondary prevention (i.e., early detection and diagnosis of cancers); strengthening of existing cancer treatment facilities; palliative care in terminal stages
Vision	National Programme for Control of Blindness	1976	To reduce the burden of blindness through identification and treatment of the blind; to develop eye care facilities in every district; to develop human resources for providing eye care services; to improve quality of service delivery; to secure participation of voluntary organizations
Mental health	National Mental Health Programme	1982	District mental health care; upgrade of mental hospitals; increasing specialist human resources; school mental health care promotion; research; advocacy
Tobacco control	Indian Tobacco Control Act	2003	Increased taxes on tobacco products; smoking in public places ban (2008); pictorial warnings on tobacco products
Hearing	National Programme for Prevention and Control of Deafness	2007	Prevention of avoidable hearing loss caused by disease or injury; early identification, diagnosis, and treatment of ear problems causing hearing loss and deafness; treatment of deafness in people of all ages; promotion of intersectoral collaboration to improve the standard of care for people with hearing disorders; provision of equipment and training to ear care services
Cardio-vascular disease and diabetes	National Programme for Prevention and Control of Diabetes, Cardiovascular Disease, and Stroke	2008	Risk reduction for prevention of diabetes, cardiovascular disease, and stroke; early diagnosis and appropriate management of diabetes, cardiovascular diseases, and stroke
Road traffic injury	Draft National Road Safety Policy (Sundar Committee Report)	Under final stages of approval	The development of institutional mechanisms for promoting road safety; implementation of cost-effective interventions; prioritization of most cost-effective interventions; promotion of research and information systems; development of standards, guidelines and road safety education
	Draft National Road Transport Policy (Thangaraj committee report), National Urban Transport Policy	Under final stages of approval/ recommended for approval	Includes road safety as an essential component to be integrated with transport development. Focus on urban development, transport patterns and mobility, and control of noise and air pollution
All injuries	National Trauma Care Programme	11th plan	To strengthen trauma care in hospitals; increasing the number of ambulances on highways; training of doctors

Source: Vikram Patel, Somnath Chatterji, Dan Chisholm, et al. "Chronic Diseases and Injuries in India," *The Lancet* 377(9763) (2011): 419.

This is not as extreme as it sounds. A key to this problem is avoiding onset of the diseases in the first place, or at least delaying onset and limiting severity. The interventions listed above all presume a viable healthcare infrastructure. They further require the willingness of public policy-makers to implement often unpopular public health measures relating to tobacco and alcohol advertising, tobacco and alcohol taxation, and stricter enforcement of traffic safety laws (which varies by region). The role of businesses in such interventions is one of cooperation, collaboration, and promotion of the public good. Requisite medicinal interventions can leverage off the commanding position established by the Indian generic pharmaceutical industry, but with emphasis on public health programs and the education of citizens.

Figure 2.3 describes short-term and medium-term strategies for the control of chronic diseases and injuries. Over the short term (2 years), strategies include implementation of all extremely cost-effective interventions listed in Figure 2.3; mandatory health-impact assessment of all macroeconomic policies; social insurance-funded care for all chronic diseases and injuries for the poorest third of the population; and implementation of health information systems for chronic diseases. Medium-term (5-year) strategies include full integration of chronic disease and injury prevention and control programs with national health missions; comprehensive coverage of all chronic diseases and injuries by social insurance and private insurance policies; and implementation of all remaining cost-effective interventions listed in Figure 2.3.³⁶ These are appropriate targets, but implementation and success will require a broad coalition of public- and private-sector efforts.

Healthcare human resources

The situation

India has a severe shortage of human resources for health (see Chapters 3 and 4). Qualified health workers are in short supply and unevenly distributed geographically (i.e., heavily concentrated in urban areas).³⁷ Many Indians, especially those living in rural areas, receive care from unqualified providers. Bringing qualified health workers to rural, remote, and underserved areas poses a multifaceted challenge. Prior decades have witnessed a substantial urban migration and concentration of qualified allopathic doctors and nurses. Resources to train more physicians and nurses likewise remain inadequate and unevenly distributed geographically. Moreover, the rapid privatization of medical and nursing education may have important implications for provider quality and professional self-governance. Finally, little attention is paid during medical education to the medical and public health needs of the population. Such issues result from underinvestment in and poor governance of the health sector – two issues that the government urgently needs to address.³⁸

Innovative interventions

There are numerous interventions underway; here we highlight steps taken in the state of Tamil Nadu. Among others, the state established new positions in primary healthcare settings. Nurse

Figure 2.3: Intervention Strategies Categorized by Level of Health System and Cost Effectiveness.

	Extremely cost effective (<US\$ 100) per DALY averted	Cost effective (US\$ 100 to 1000) per DALY averted	Less cost effective (>US\$ 1000) per DALY averted
Population-wide interventions	Prevention and control of tobacco and alcohol use (through measures to reduce advertising, availability, and affordability of products, especially bidis and locally brewed alcohols); dietary salt reduction program; screening for refractory error and provision of glasses	Screening for hearing loss and provision of hearing aids; road traffic injury prevention (enforcement of speed limits, drink-driving law, motorcycle helmet use, and seat belt use)	Bicycle helmet use by children
Primary-care interventions	Preventive drug treatment for high blood pressure (systolic blood pressure >160 mm Hg)	Preventive drug treatment for high cholesterol; preventive combination therapy for individuals at high risk of a CVD event; flu vaccination (for people aged > 60 years) and smoking cessation programs for people with COPD; brief interventions for alcohol misusers; depression treatment	
Secondary-care and tertiary-care interventions	Treatment of stage 1 breast cancer (lumpectomy and radiotherapy); extensive breast cancer program (treatment of all stages and biannual screening for women aged 50–70 years)	Treatment of acute MI with aspirin or streptokinase; treatment of post-acute MI with aspirin, ACE inhibitors, beta-blockers, or statins; treatment of post-acute ischemic stroke with aspirin, statins or blood-pressure-lowering drugs; treatment of CHF with ACE inhibitors or beta-blockers; extracapsular cataract extraction with posterior chamber lens implant	Treatment of acute MI with ACE-inhibitors or B-blockers; organized stroke unit care; treatment of severe COPD disease and exacerbations; intracapsular cataract extraction by use of aphakic glasses; schizophrenia treatment
This table only includes interventions for which cost-effectiveness estimates have been calculated. DALY = disability adjusted life years. CVD = cardiovascular disease. COPD = chronic obstructive pulmonary disease. MI = myocardial infarction. ACE = angiotensin-converting enzyme. CHF = congestive heart failure			

Source: Vikram Patel, Somnath Chatterji, Dan Chisholm, et al. "Chronic Diseases and Injuries in India," *The Lancet* 377(9763) (2011): 423.

staffing levels, in particular, were expanded from one to three. These teams of nurses each coordinate with two medical officers to provide round-the-clock service. Tamil Nadu has also made provision for education of physicians and nurses in the public sector. Incentives and policies are in place to attract and retain personnel. In return for education, professionals dedicate 3 years to mandatory rural service. Finally, the state has established a separate Directorate of Public Health and Preventative Medicine with its own professional staff. Medical and nursing education also incorporates a focus on public health matters.

Tamil Nadu's strategy can be duplicated and scaled to improve healthcare systems in other states. There is a general concern in the public health community over the quality and relevance of clinical training undertaken at private schools for medicine and nursing, particularly since medical education notoriously overemphasizes specialization at the expense of solid preparation for work in the primary care setting. Students are ill prepared to face problems commonly encountered in India, including those relating to child and maternal health or typical infectious diseases; consequently, they graduate inadequately trained for clinical practice and without confidence in treating patients. This need not necessarily be the case. Knowledge of and exposure to public health issues among privately trained physicians could be increased through standardized testing and mandatory continuing education. The education and utilization of allied health professionals, such as health assistants, lady health visitors, and others, can also be strengthened.³⁹

Business and organizational challenges

Service in small cities, remote villages, and rural settings remains an unmet need throughout India. This is not necessarily a function of income alone, as most physicians and nurses prefer to develop their knowledge base and practice within a community of providers. Nevertheless, packages of incentives, both financial and less tangible, must be developed and supported, ideally in concert with the development of rural health insurance programs.

Healthcare finance

The situation

India's system for financing healthcare has contributed to and exacerbated other healthcare problems. These problems include health inequity, inadequate availability and reach, unequal access, poor quality, and costly services.

It is not a simple task to compare health expenditures among nations and establish meaningful benchmarks. In 2005, India's total spending as a function of GDP (4.15 percent) was far below the global average of 6 percent; on a per capita basis it ranked below other neighboring countries. The public versus private portions of spending further mask the picture. When private funds are considered, the Indian economic allocation to health could reach close to 5 percent of GDP in some years (e.g., 2001–02); public spending on health in India is among the very lowest in the world, however. The Government of India has made a commitment to increase public spending on health from less than 1 percent to 3 percent of GDP during the next few years.⁴⁰

Low per capita expenditures on health and low public expenditures result in one of the highest proportions of private out-of-pocket expenses in the world. Two features of private out-of-pocket expenditures are noteworthy. First, about three quarters of expenditures are incurred for outpatient care; the majority of the balance is for inpatient treatment (see Chapter 3, Figures 3.12 and 3.13). Second, pharmaceuticals account for 55–74 percent of the

total private out-of-pocket expenditure (see Chapter 3).⁴¹ A back-of-the-envelope calculation suggests that roughly 40 percent of India's healthcare costs are for medicinals. This is truly remarkable because most of India's pharmaceuticals are manufactured domestically and sold just slightly above marginal cost. These findings have implications for insurance coverage and cost control.⁴²

A look at the cost of specific healthcare services is no more encouraging. Between 1986 and 2004, the average real expenditure for hospital admission increased threefold in government and private hospitals, both urban and rural. As of 2005, healthcare represented 6.6 percent of rural household consumption and 5.2 percent of urban household consumption. The cost of pharmaceuticals compounded the situation: medicines have been growing at a rate double that of private-sector services.⁴³

As stated elsewhere in this chapter (and later in Chapter 10), growth in the level of insurance coverage in India has been slow until recently. There are several reasons for the slow increase in coverage. Only 7 percent of India's workforce is employed in the organized sector. The remainder are cultivators, agricultural laborers, fishermen, artisans, and the like who do not have a structured income. For these people, regular insurance premiums are not easily affordable and the administrative aspects of such a program are daunting.⁴⁴

Also, as stated earlier, there is no reliable estimate on the percentage of the population covered. One reason is the remarkable take-off of central and state government health insurance schemes such as Rashtriya Swasthya Bima Yojana (RSBY), which make estimates of insurance coverage a rapidly moving target. Determination of the number covered is further complicated by the range in the types of insurance coverage offered. As of 2009–2010, as many as 25 percent of India's population may have some form of coverage – a percentage up from single digits earlier in the decade.⁴⁵

Finally, India's public healthcare sector is largely fragmented. While the best government hospitals offer top-flight care at affordable prices, they are neither plentiful nor characteristic. Public healthcare services are provided through thousands of health subcenters, primary health-care centers, and community hospitals. The system comprised by this vast range of facilities does not run efficiently and is commonly understaffed (see Chapter 3). Most communities lack confidence in their local facility.

The private sector enjoys the perception of higher quality, although there are reservations. First, it does not offer quality care at affordable prices. Second, it does not guarantee access to the poor, preferring instead to treat the population with higher incomes and medical tourists.⁴⁶ Third, the government has been only partially successful in incenting private hospitals to accommodate the health needs of the poor via land grants and tax concessions.

Innovative interventions

The Lancet proposed six theoretical policy responses to India's financing challenges:

1. Ensure achievement of the government's commitment to increase public spending on health from less than 1 percent to 3 percent of GDP.

2. Improve quality, performance efficiency, and accountability of public and private health systems.
3. Introduce policy and legislative changes to contain the rising costs of medical care and drugs.
4. Increase the availability of health services through direct expansion of public health services and by enlisting private providers of allopathic and non-allopathic drugs.
5. Increase insurance and risk pooling to include financial protection.
6. Introduce a predominantly tax-paid universal medical insurance plan that offers essential coverage to all citizens.⁴⁷

Business and organizational challenges

Five of the six above interventions involve engagement of the private sector to some degree. There is little doubt, however, that public expenditures on health in India must be increased. The key challenge is how best to allocate that spending. Should it be channeled through insurance programs for the poor so that they may decide where to purchase care?

Access to care and health equity

The situation

Despite improvements in access to healthcare, India continues to suffer from inequalities related to socioeconomic status, geography, and gender that are compounded by high out-of-pocket expenditures. Healthcare expenditures exacerbate poverty, with about 39 million additional people falling into poverty every year as a result of such expenditures. India faces key challenges for the achievement of equity in service provision, and equity in financing and financial risk protection. These challenges include an imbalance in resource allocation, inadequate physical access to high-quality healthcare services and providers, high out-of-pocket health expenditures, inflation in health spending, and behavioral factors that affect the demand for appropriate healthcare.⁴⁸

There are several key contributors to healthcare inequities in India. With respect to immunizations, data from the National Family Health Survey (2005–06) reveal that only 44 percent of Indian children receive the full battery of recommended vaccines and boosters (compared to higher immunization rates for adults – see Chapter 1).⁴⁹ Children of mothers with more than 5 years of education were nearly 3 times as likely to have the full regimen compared to the children of mothers with no education. Income levels are associated with women delivering their babies in a healthcare facility: women in the richest quintile are 6 times more likely to use the services of an institution in childbirth (with a national average of 40 percent). There are also significant variations in healthcare spending geographically. First, among the Indian states, per capita health expenditures in Bihar were estimated to be INR 93 compared with INR 630 in Himachal Pradesh in 2004–05. The imbalance also characterizes urban (higher) versus rural (lower) expenditures. Finally, with the overall growth of the Indian economy in the last two

decades, there has been a corresponding increase in the absolute cost of healthcare. While costs have increased in both the public and private sectors, the rate of increase in the private sector is perhaps double that in the public sector. This has adversely impacted the poor by disenfranchising them from private-sector care.

Innovative interventions

Building health equity into the metrics of evaluating healthcare programs is an essential step. While national policies, data capture, and new standards for assuring health equity are necessary, the reality is that these are evolutionary and will not address short-term needs. In the interim, despite the cost factors, several private-sector strategies are proving that a profit motive (albeit one with tiered pricing) can provide healthcare across the spectrum of socioeconomic groups. The private sector should play an expanded role in the provision of care. *The Lancet* series is silent on the role of private hospital systems such as Max Healthcare, Apollo, and Fortis (see Chapter 5) in serving the middle class and the less fortunate. The efforts undertaken by the Aravind Eye Care System, Dr Devi Shetty's Narayana Hrudalaya cardiac hospital center, and the Vaatsalya Hospital system (Karnataka) strategy for delivering care in underserved areas (profiled in Chapters 6, 7, and 9), all offer valuable and reproducible strategies. The challenge of expanding the private sector's role in promoting access and equity encompasses all the above issues as well as meeting the capital needs of the organizations.

Business and organizational challenges

Any data-driven approach and analytic framework for change must be driven by systems analysis and software development undertaken by the private sector. The quest for health equity presents an ideal opportunity for a series of public-private partnerships directed at definition, data capture and analysis, and transfer and implementation of the conclusions into practice. Inasmuch as three quarters of Indian healthcare is privately provided (see Chapter 3), and that care is increasingly funded by insurance programs, several elements of a fully integrated system are falling into place. The equity criterion must still be addressed through national dialogue and resolve, but the Indian Constitution itself provides the legal basis:

Policies oriented towards incorporation of equity metrics in monitoring, assessment, and strategic planning of health care; investment in development of a rigorous knowledge base of health-systems research; development of equity-focused process of deliberative decision making in health reform; and redefinition of the specific responsibilities and accountabilities of key players along with strengthening the foundation of public health and primary care, provide an approach for ensuring more equitable health care for India's population.⁵⁰

There is also a substantial role for risk pooling, especially when programs can be subsidized for the poor. Chapters 10 and 11 profile some of the public and private schemes that can contribute toward solutions for health equity.

Conclusion

This chapter began by exploring the relationship between health and economic development, and then examined each of the six broad problems confronting India:

1. Continuing burden of infectious diseases
2. Reproductive and child health and nutrition
3. Chronic diseases and injuries
4. Healthcare human resources
5. Healthcare finance
6. Access to care and health equity

The thesis of this chapter is that innovation is the key to managing these seemingly insurmountable problems. What is the bedrock of innovation in the matter of health? At the risk of sounding too western, it is a matter of national and state leadership setting goals, standards, and timelines for the country and allocating the financial resources necessary to meet these where and when it is not reasonable to expect the private sector to step in and fill the gap. At this phase in India's development, a transition to a market-driven healthcare system must be preceded by a period of public-private partnership whereby governments and businesses find ways of collaborating in order to meet social goals and enable citizens to improve their health and well-being. These goals might include the following:

1. Incorporation of standards of care and practice drawn from those existing in India currently and elsewhere in the world.
2. Access to medicines and technologies used elsewhere in the world and incorporation into the fabric of Indian healthcare.
3. Pooling of risk on an equitable basis, perhaps subsidized for a portion of society, so that access to care is attainable by the vast majority of citizens on an equitable basis that does not lead to financial ruin.
4. Development of indigenous pharmaceutical, biotechnology, and medical device sectors that will better focus on the special needs of the Indian population.
5. Rapid education of healthcare workers across the spectrum of needed human resources.
6. Respectful inclusion of traditional medicines and practices into the standards of contemporary care.

These are just a few of the many goals that can be articulated. Physicians, nurses, and others with direct responsibility can conjure several more. Such goal-setting marks the beginning of the paced process that will yield progress toward a healthy Indian society.

Notes

1. David Bloom, David Caning, and J. Sevilla. 2004. "The Effect of Health on Economic Growth: A Production Function Approach." *World Development* 32(1): 1–33.
2. Stephen Sammut and Lawton R. Burns. 2011. "Meeting the Challenges of Healthcare Needs in India: Paths to Innovation." *Insight: Journal of the Indian School of Business* 9(2):5–9.
3. Ajay Mahal, Bibek Debroy, and Laveesh Bhandari, eds. 2010. *India Health Report 2010*. New Delhi: Business Standard Books; Central Bureau of Health Intelligence (CBHI). 2007. *National Health Profile 2007*. New Delhi: Director General of Health Services, Ministry of Health and Family Welfare, Government of India; Richard Horton and Pamela Das. 2011. "Indian Health: The Path from Crisis to Progress." *The Lancet* 377(9761):181–3.
4. Mahal et al. (2010).
5. Ibid.; Mohan Rao, Krishna Rao, A.K. Shiva Kumar, et al. 2011. "Human Resources for Health in India." *The Lancet* 377(9765):587–598.
6. Some ascribe this statement to Lawrence (Larry) Summers, but I cannot corroborate this.
7. Mahal et al. (2010), pp. 2–3.
8. Ibid., p. 7.
9. Ibid., p. 4.
10. Ministry of Health and Family Welfare, Government of India.
11. According to some research reports, public hospitals have market share of 38–41 percent, while public ambulatory care sites have market share of 19–22 percent.
12. Sammut and Burns (2011).
13. Geeta Anand and Shreya Shah. 2012. "India Bureaucracy Slows Treatment of Tuberculosis." *Wall Street Journal*, October 11.
14. While low, the percentage of children who are fully vaccinated has been gradually rising over time, according to the National Family Health Survey. The percentages are 35.4 percent (1992–93), 42.0 percent (1998–99), and 43.5 percent (2005–06). Source: Planning Commission, Government of India. 2012. *Databook for DCH*, April 10. Accessed October 20, 2012. http://planningcommission.nic.in/data/datatable/0904/comp_data0904.pdf.
15. T. Jacob John, Lalit Dandona, Vinod Sharma, and Manish Kakkar. 2011. "Continuing Challenge of Infectious Diseases in India." *The Lancet* 377(9761):252–269.
16. Ibid., p. 265.
17. Ibid., p. 252.
18. Ibid.
19. Planning Commission of India. 2011. *High Level Expert Group Report on Universal Health Coverage for India*. Delhi: Author.
20. John et al. (2011).
21. Margaret Hogan, Kyle J. Foreman, Mohsen Naghavi, Stephanie Y. Ahn, Mengru Wang, Susanna M. Makela, Alan D. Lopez, Rafael Lozano, and Christopher J.L. Murray. 2010. "Maternal Mortality for 181 Countries, 1980–2008: A Systematic Analysis of Progress towards Millennium Development Goal 5." *The Lancet* 375(9726):1609–1623.
22. Vinod Kumar Paul, Harshpal Singh Sachdev, Dileep Mavalankar, Prema Ramachandran, Mari Jeeva Sankar, Nita Bhandari, Vishnubhatla Sreenivas et al., 2011. "Reproductive Health and Child Health and Nutrition in India: Meeting the Challenge." *The Lancet* 377(9762): 332–349; Paul et al. (2011), p. 333.
23. Ibid., p. 334.
24. Note from the editor: The number of districts in India is a moving target, as the population grows rapidly. According to the 2011 census, there were 640 districts. According to some Government of India websites

(“Know India: National Portal of India,” <http://www.india.gov.in>), there may be as many as 659 districts. For our purposes in this and subsequent chapters, we will use the 640 figure.

25. Paul et al. (2011).
26. Ibid., pp. 345–347.
27. Ibid., p. 339.
28. Mahal et al. (2010), p. 32.
29. D. Prabhakaran, n.d. “Overview of Non-Communicable Diseases in India.” Center for Chronic Disease Control. Accessed October 20, 2012. <http://www.c3health.org/wp-content/uploads/2010/05/Prabhakaran-NCDs-in-India-20100419.pdf>.
30. Mahal et al. (2010), p. 32.
31. Vikram Patel, Somnath Chatterji, Dan Chisholm, Shah Ebrahim, Gururaj Gopalakrishna, Colin Mathers, Viswanathan Mohan, Dorairaj Prabhakaran, Ravilla D. Ravindran, and K. Srinath Reddy. 2011. “Chronic Diseases and Injuries in India,” *The Lancet* 377(9763):413–428.
32. Ibid., p. 414. The communicable disease category includes maternal, perinatal, and nutritional disorders.
33. Prabhakaran, n.d.
34. Patel et al. (2011), p. 418.
35. Ibid., p. 415.
36. Ibid., p. 426.
37. Rao et al. (2011).
38. Ibid.
39. Ibid.
40. A. K. Kumar, Lincoln C., Chen, Mita Choudhury, Shiban Ganju, Vijay Mahajan, Amarjeet Sinha, and Abhijit Sen. 2011. “Financing Healthcare for All: Challenges and Opportunities,” *The Lancet* 377(9766):668–679.
41. The 74 percent figure is an upper bound suggested by the *High Level Expert Group Report on Universal Health Coverage for India* (Planning Commission of India, 2011).
42. Kumar et al. (2011), pp. 669–670.
43. Ibid., p. 671; Y. Balarajan, S. Selvaraj, and S.V. Subramanian. 2011. “Healthcare and Equity in India,” *The Lancet* 377(9764):505–515; Balarajan et al. (2011), p. 506.
44. Kumar et al. (2011), pp. 670–671.
45. K. Srinath Reddy, Sakthivel Selvaraj, Krishna Rao, Maulik Chokshi, Preeti Kumar, Vandana Arora, Sachin Bhokare, and Isheeta Ganguly. 2011. *A Critical Assessment of the Existing Health Insurance Models in India*. New Delhi: Public Health Foundation of India.
46. Kumar et al. (2011), p. 671.
47. Ibid.
48. Balarajan et al. (2011), p. 505.
49. See Note 14.
50. Balarajan et al. (2011), p. 506.