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INNOVATIONS IN HEALTHCARE™

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Executive Summary

The Center for Strategic and International Studies (CSIS) Wadhwani Chair in U.S.-India Policy Studies and Duke University's Innovations in Healthcare have launched the "Indian States Health Innovation Partnership," a unique program to catalogue and expand subnational healthcare cooperation between Indian government entities and external partners. The paper which follows is the result of Phase One of this project, which was generously funded by the Hans Foundation and the Ford Foundation. During this phase, the team developed a clearer picture of India's state-level healthcare reform priorities across four key areas discussed below.

Healthcare capacity challenges ranked highly among state level government officials. In particular, many cited workforce development (such as improving the training of allied health professionals and hiring new clinicians) and the development and supply of pharmaceuticals and medical devices as areas for potential partnership. States also consistently looked to adopt new types of delivery models—such as bolstering primary and preventative care and coordinating services better. To support these shifts, respondents are looking to enhance the current health information technology (IT) infrastructure by digitizing health data and achieving interoperability across siloed data systems. Another critical area for engagement includes strengthening health financing, particularly procuring and strategically purchasing services and goods across the health care ecosystems, from providers to manufactures to retailers.

As chronic diseases like diabetes and chronic obstructive pulmonary disease are increasingly gaining attention across India, states are simultaneously targeting broader social determinants of health, including environmental and lifestyle factors. States continue to prioritize issues related to the most vulnerable, disadvantaged groups, including women and children, elderly, poor, and rural populations. As such, reproductive, maternal, newborn, and child health (RMNCH) and infectious diseases (e.g. malaria, tuberculosis, diarrhea) remain paramount concerns among health officials.

This project identified specific areas for potential partnership across four categories: capacity building, organizational delivery, financing, and specific health conditions. The chart below outlines these opportunities by state and area of focus. In addition, state leaders were asked to highlight more general priorities for their states' health care systems. These priorities are also outlined in each of the sections that follow as well as in a chart in Appendix One of this document.

STATE	AREAS FOR COLLABORATION			
	Capacity Building	*Organizational Delivery*	*Financing*	*Health Areas*
Bihar	▪ Training in mentorship for nurses ▪ Emerging applications for telemedicine ▪ GIS solutions for planning the expansion of health care infrastructure ▪ Automation of hospital business functions	Integrated data analytics program to better use health data for informed policy choices	Creation of a financial management system for state expenditures to help manage and expedite spending	New family planning tools that leverage social media or other technologies
Chhattisgarh	Management and leadership skills training			
Jharkhand	Medical research capacity building			
Karnataka	Integration of 50 different health platforms within state			
Madhya Pradesh	▪ Training for allied service providers ▪ IT tools to address states HR shortage	System for using data to understand health metrics		
Odisha	Training in basic emergency care, pediatric surgery, cardiology, rare diseases, blood disorders, cancer care, trauma and burn care, robotic surgery			▪ Primary health center development in unreachable and tribal areas ▪ Mapping where health deficiencies exist
Punjab	Patient education, including lifestyle advice and behavior changes			
Tamil Nadu	▪ Technical assistance to study how to best establish new centers ▪ Gap analysis for laboratory strengthening plan			▪ Non-communicable disease management ▪ Auto accident trauma care
Telangana	Mentoring for para-medical staff			
West Bengal	Skills development training for rural health workers and supervisors			
Maharashtra			Mechanism for integration of 70+ information systems so that they exchange information	

Introduction

Many international institutions—universities, foundations, companies, NGOs, governments—would like to engage more deeply with the government of India to improve health outcomes. However, a lack of transparency, changing state-level priorities, and the absence of a single venue to learn about engagement opportunities holds back many potential partnerships.

The "Indian States Health Innovation Partnership," seeks to address this information gap and encourage subnational health care cooperation between Indian government entities and external partners. The primary goal of this project is to strengthen health outcomes in India by methodically identifying which Indian states are ripe for innovative partnerships with international institutions and broadcasting these opportunities publicly to spur future partnerships.

In the first phase of this project, the research team conducted interviews with government health care leaders in 15 Indian states. Surveys were sent to the remaining 14 states, supplemented by desk research for states that did not respond. Through this process, the team developed a clearer picture of India's state-level health care reform priorities, which are described in the remainder of this paper.

Phase Two of this project will focus on identifying mutually beneficial technical assistance and capacity building partnerships between external entities and the Indian states described in this paper. A second publication, which further explores effective models and elements for partnerships with Indian states, will be released later in 2019.

Background

On March 16, 2017, India's Union Cabinet approved a new National Health Policy, 15 years after the last iteration of such a policy. The document includes an ambitious vision, calling for both national and state governments to—among many objectives—increase public spending, improve public health care standards, achieve universal health care, and bolster primary health care.

Critically, the policy advocates for expanding and aligning the role of private health care sector with public health goals. It explicitly calls for partnerships with academic institutions, not-for-profit agencies, and other health care stakeholders across a wide-range of activities, including: capacity building, skill development, corporate social

responsibility, mental health, disaster management, strategic purchasing, immunization, disease surveillance, tissue and organ transplantations, and health information systems.[1,2]

SHIFTING HEALTH CONTEXT

India's National Health Policy 2017 highlights many ways in which the context of health care delivery has shifted in recent years. New challenges to be addressed include the rise of non-communicable and infectious diseases, as well as the growing incidence of catastrophic expenditure due to health care costs. At the same time, the policy identifies new opportunities with the growth of the country's health care industry and the overall fiscal capacity of the nation.

The current Indian government, led by Prime Minister Narendra Modi, has focused on decentralizing governance, devolving greater shares of central tax revenue—and hence decision making—to the states.[3] As such, states have an expanded mandate to design and execute policies, deploy new technologies, and foster innovation and entrepreneurship in the health sector. Each state serves as a laboratory for how the health care ecosystem can be tailored to meet India's diverse development challenges. There is no single story or pathway to partnership; each state has its own challenges and opportunities. Given the heterogeneity of needs and challenges, understanding the policy priorities of each individual state is key to building sustainable, productive partnerships.

The Indian States Health Innovation Partnership team analyzed these diverse priorities through the lens of four broad categories: capacity building, organizational delivery, financing, and specific health condition, detailed in the chart below.

Category	Definition	Examples of Subcomponents
Capacity	The ability of health care systems to bring about desired health care outcomes, contingent on resources and competencies	Medical Infrastructure, Pharmaceutical and Devices, Information Technology, Workforce
Organizational Delivery	The "where" and "how" health care is delivered	Access, Data Management, Delivery Models, Leadership and Governance
Financing	The amount, manner, and mechanisms in which resources are allocated to health care services	Budget Allocation, Procurement, Provider Payments, Raising Revenue, Pooling Financial Risk
Health Conditions	An umbrella for all major health indicators and needs	Non-Communicable Diseases, Communicable Diseases, Reproductive, Maternal, Neonatal, and Child Health, Acute Care, Mental and Behavioral Health

The sections that follow provide an overview of the general situation in each of these areas, as well as specific opportunities for partnership between states and external actors.

Capacity

Health care capacity encompasses the resources and skillsets required to achieve desired health outcomes. Challenges related to health care capacity ranked as a top concern across state government stakeholders surveyed. In particular, many cited workforce development challenges, technical and logistical barriers in distributing and developing pharmaceuticals and medical devices, and infrastructure needs like adequate medical equipment, hospital beds, and laboratories. The graphic below provides an overview of the priority areas identified by each state in the area of capacity.

Priorities	Infrastructure	Pharmaceuticals or devices	Information Technology	Partnerships/ Collaboration	Workforce	Patient Engagement
Bihar					X	X
Chhattisgarh	X		X	X	X	X
Punjab		X			X	
Jammu and Kashmir	X	X		X		
Jharkhand		X	X		X	
Karnataka		X	X	X	X	
Kerala		X				
Maharashtra	X	X			X	
Madhya Pradesh	X	X			X	
Nagaland	X	X	X		X	
Odisha		X	X		X	X
Tamil Nadu	X		X		X	
Telangana	X	X	X	X	X	X
Uttarakhand		X	X		X	
Uttar Pradesh	X	X		X	X	
Rajasthan					X	X
West Bengal					X	

Workforce Development

Workforce issues ranked chief among stakeholders interviewed. Although India has made great strides in recruiting additional health care workers, severe shortages exist, with eight health workers per 1000 population—less than half of the World Health Organization's benchmark.[4] Most state level stakeholders interviewed focused on a lack of specialists. Examples include anesthetists (Jharkhand, Maharashtra, and Gujarat), mental health professionals (Kerala), and pediatricians (Jharkhand). Unsurprisingly, workforce shortages are more pronounced in rural areas—including primary physicians and nurses in addition to specialists. Stakeholders also identified a need to improve the technical capacity of medically trained allied professionals and health care administrators.

SUCCESSFUL PARTNERSHIPS: CAPACITY

Noora Health, a non-profit organization based in Bangalore trains patients, caregivers, and family members in health skills to improve outcomes. The Noora model uses an iPad app with videos, quizzes, and interactive content for patients and their families to develop the skills for at-home recovery. Noora began in 2014, partnering with the state of Karnataka to implement a Newborn Care Training Program for nurses and has expanded to work with the governments of Punjab, Madhya Pradesh, Karnataka, and Maharashtra. To date, Noora has trained over 200,000 family members.

Medical Education

Despite severe shortages in both credentialed and unaccredited health care professionals, India leads the world in the number of medical schools.[5] Across states interviewed, policymakers prioritized improving the quality, not quantity, of medical education providers. Several states pointed to strengthening the accreditation system for health care providers as a key step. Recently, private medical colleges have expanded rapidly, raising concerns about the number of unqualified or undertrained providers: an estimated 40 percent of private care is provided by unqualified providers.[6] Some stakeholders recommended creating an up-to-date, centralized registry of qualified doctors; others suggested bolstering and standardizing the medical curriculum as possible solutions.

Health Care Infrastructure

Several states expressed an interest in improving physical access to care, particularly for rural populations, and expanding treatment options for the urban poor. To accomplish this goal, states are looking to build new hospital buildings, including general hospital facilities (Jharkhand) and tertiary and secondary hospitals (Telangana). The Ayushman Bharat's mandate of one Health and Wellbeing Center per five villages creates additional pressure to build new infrastructure. Recent statements indicate that nearly 150,000 new facilities may be opened.[7] However, there will likely be insufficient capacity to deliver on this, with some casting doubt on the national government's commitment to financially support new facilities.[8]

Given the importance of transportation and communication networks in physical access, most states also recognized a need to bolster both types of infrastructure to help bridge health care deficits in rural areas. Transportation to the nearest health care provider and associated costs can be a challenge for those in rural areas, especially during the rainy season.

There is also widespread concern with supply chain management capabilities, since medical supplies (including drugs and equipment) are not distributed consistently. Tasks that could be automated are often done manually, resulting in errors or other setbacks that create logistical bottlenecks. This situation is compounded by challenges in predicting utilization and health care demands, particularly for rural areas.

AYUSHMAN BHARAT

Access to care is contingent on a multitude of factors, including the number of providers, availability of services, and affordability of care. The recently launched Ayushman Bharat, India's National Health Protection scheme, is helping expand access to care across India by driving states to prioritize affordability, increase insurance coverage, and build new facilities. The scheme consists of two main initiatives: expanding insurance coverage to poor and vulnerable families and building one Health and Wellness Center per every five villages across India.

Information Technology (IT)

Most states see IT as critical in improving care and expanding coverage. Examples include: identifying and scaling low-cost software applications that can assist with screening, diagnosing, and managing chronic diseases; bolstering communication tools, like mHealth and telehealth services; and harnessing the analytic and predictive powers of health IT.

Potential Partnerships: Capacity

There is widespread demand to improve and expand training and education for health care personnel across the states surveyed. Several stakeholders suggested medical colleges as the entry point for engagement as medical education institutions across the country grow. Odisha, Jharkhand, Gujarat, and Haryana, for example, all have plans to build additional medical colleges in the near future. The types of opportunities varied by state. Below is a brief list of the areas where states are interested in collaborating with external actors:

- Bihar: Training nurses to become mentors so that nurses can train their peers within a district
- Chhattisgarh: Provision of management and leadership skills development
- Jharkhand: External technical capacity building and collaboration in medical research
- Kerala: Medical education related to trauma and emergency medicine
- Madhya Pradesh: Short term trainings for allied services providers such as technicians, nurses, or dental hygienists

- Odisha: Basic emergency care, pediatric surgery, cardiology, rare diseases, blood disorders and cancer care, trauma and burn care, and robotic surgery to build capacity in the state
- Tamil Nadu: Technical studies focused on how best to establish 10,000 new nurse-run health centers that are planned in the near term and on strategies for improving laboratory facilities
- Telangana: Mentoring of para-medical staff
- West Bengal: Intensive skills development training for rural health care workers; training for supervisors at health care centers

In the area of health information technology, stakeholders were interested in collaborating for improved integration of platforms and addressing operational challenges. Specific requests included:

- Bihar:
  - Emerging applications for telemedicine, including the question of how phones and other technologies can be used to strengthen health care, particularly in rural areas
  - GIS to develop long-term budgets that expand health care access cost-effectively
  - Developing and deploying technologies that can help automate business functions like budgeting, procurement, human resources at state hospitals
- Madhya Pradesh: IT tools to address the human resources shortage in the state

Organizational Delivery

Organizational delivery focuses on where and how health care is delivered. It encompasses mechanisms for governing health care systems and models of arranging services to achieve desired health outcomes. The states surveyed overwhelmingly felt that mechanisms for improving data management and for improving delivery models were ripe for partnership. The table below lays out priorities highlighted by state officials surveyed.

Priorities	Expanding Access	Data Management	Outcomes-Based Measurement	Data Types	Delivery Models	Leadership and Governance	Private sector
Bihar		X			X		
Chhattisgarh					X		
Punjab	X	X			X	X	
Jammu and Kashmir		X		X	X		
Jharkhand		X			X		
Karnataka	X	X	X		X	X	
Kerala		X	X		X	X	X
Maharashtra		X					
Madhya Pradesh		X	X				
Nagaland		X	X	X	X	X	
Tamil Nadu	X	X	X				
Telangana		X	X		X		
Rajasthan	X	X				X	
West Bengal					X		X

Delivery Models

The states of Punjab, Madhya Pradesh, Gujarat, Telangana, and Maharashtra recognize primary care as critical to improve access and reduce costs. Ensuring sufficient infrastructure and capacity will be critical to support a robust primary care system.

Stakeholders also identified a need to improve care coordination in areas such as patient referral patterns and workflow management systems. Most states had minimal patient

referral system protocols, which severely undercuts efforts to strengthen primary care. Patients typically opt for hospitals over primary clinics, even for minor incidents. Hospitals, in turn, rarely refer back down to primary clinics. States also expressed a desire to improve linkages with mental health services. Despite the 2017 Mental Health Care Act, which includes provisions to better integrate and support mental health services,[9] implementation on the ground remains inadequate.[10]

Stakeholders also identified a need to standardize delivery protocols. For instance, Tamil Nadu is working with Australia's National Trauma Research Institute to create uniform emergency policies, including developing trauma registries and tracking patients from the first interaction to discharge.[11]

Data Management

States are looking to improve the management and usage of health data. Some states (particularly Punjab, Jharkhand, and Karnataka) highlighted the need to digitize records, noting the time wasted manually entering data. Other states (Maharashtra, Karnataka, and Madhya Pradesh) are focusing on improving interoperability across traditionally siloed health information systems. Interviewees also cited gaps in their ability to effectively analyze data. Stakeholders in Uttar Pradesh and Madhya Pradesh, for example, would like to utilize data to better monitor and improve performance.

SUCCESSES IN ORGANIZATIONAL DELIVERY

UE LifeSciences developed a hand-held, wireless, painless, and radiation free breast imaging device. Health care workers in rural locations can use the device to perform breast examinations in five minutes. The company has introduced over 150 devices in the Indian market, and has entered into agreements with Maharashtra, Goa, Chhattisgarh and Mizoram to make the product more widely available. Through their partnership with the Maharashtra government, UE LifeSciences has pre-screened more than 80,000 women and helped detect over 100 new cases at an early stage.

Potential Partnerships: Organizational Delivery

Explicit requests for partnership in organizational delivery centered around developing and improving health IT and data management. These included:

- Bihar: Integrating and analyzing data across the state to inform policy decisions
- Karnataka: Integration of the 50 different health IT platforms currently used within the state
- Maharashtra: Integrating siloed data systems
- Madhya Pradesh: Developing data analytics for monitoring improvements in outcomes and utilization

Financing

While mentioned less than other categories, financing played a prominent role in certain states, particularly procurement, strategic purchasing, providers' payments, and insurance fraud detection and prevention. Though no state explicitly identified a need for more overall health care funding, several states want to improve the disbursement and allocation of funding. States frequently underspend their allotted health care budget, only spending about 60 percent of central government funding. As a result, several states emphasized the necessity to expedite the expenditure process. Policy documents and other literature demonstrate that high out of pocket costs remain a challenge in several states, indicating that individuals may continue to shoulder a larger burden of health care costs.

The chart below provides an overview of the priorities highlighted by each state.

Priorities	Budget Allocation	Procure-ment, Strategic Purchasing	Pooling Financial Risk	Provider Payments	Raising revenue	Financing for UHC or prima-ry care	Donor versus domestic financing	Overall health financing reform
Bihar	X							
Chhattisgarh						X		
Punjab				X				
Jammu and Kashmir	X	X						
Jharkhand		X						
Karnataka	X	X	X	X	X	X		X
Kerala		X	X	X		X		X
Maharashtra				X		X		
Madhya Pradesh		X		X		X	X	X
Nagaland	X	X		X				
Rajasthan	X	X						
Telangana							X	X

Procurement

Most stakeholders prioritized strengthening the quantity, quality, and distribution of medical equipment. In particular, respondents pointed to inefficient or antiquated bidding procedures. According to interviewees, procurement procedures, including pricing for products, are often controlled at the national level, leaving states with little autonomy in purchasing decisions. Madhya Pradesh, for instance, has regulations in place that limit procurement to equipment that has been certified according to EU or U.S. standards. Often procurement offices prioritize cost over quality, resulting in subpar equipment. When states do have flexibility to set health care prices, they have trouble determining an appropriate market price. Private providers in several states contend that reimbursement prices are too low. For states with decentralized procurement systems—like Madhya Pradesh—standardizing procurement processes within the state is needed, including identifying best procurement practices, and logistical challenges for streamlining drug or medical equipment purchases.

SUCCESSES IN FINANCING

Chiranjeevi Yojana is a government run-scheme started by the Health and Family Welfare Department in Gujarat. Through the scheme, the government of Gujarat contracts with private providers who volunteer to render a comprehensive array of maternal health services. Through vouchers, Chiranjeevi Yojana uses demand-side financing to provide families with access to services. In the first six months of the program, institutional delivery rates increased to more than 81 percent from about 55 percent in 2005-2006. Based on its initial success, the scheme was scaled up to the entire state and rates of institutional deliveries

Incentives/Performance: Outcomes

Performance-based financing was the second most cited priority. Policymakers are seeking general incentive systems that align health care workers with overall systemic goals. For instance, in Bihar and Chhattisgarh, policymakers view payment incentives as a key tool to motivate workers to take ownership of their work, a possible antidote to absenteeism.

Others see financial incentives as an important mechanism to align clinical activity with the appropriate type of care, particularly as the burden of disease shifts away from communicable diseases. Examples of interest in health-sensitive incentives include institutional deliveries (Punjab) and malaria community incentives (Uttar Pradesh). Several states have begun testing performance-based financing pilots, including Gujarat, which is using performance-based financing tied to RMNCH,[12] and Nagaland, where a World Bank-funded project is implementing a scheme with a results-based financing component.[13] Other states have had more limited, intermittent success in accountability-based financing, held back by insufficient technical capacity, ability to reliably and accurately measure performance, or insufficient political will.

Policy officials view current remuneration rates as either appropriate or flexible enough to encourage private providers to agree to render services. Unsurprisingly, however, multiple

private sector providers and medical industry leaders cited payment rates as too low or delayed, contributing to unethical medical practices such as over-prescription.

Potential Partnerships: Financing

Across the states surveyed, a clear opportunity exists for supply chain technical assistance, supporting Indian states to reliably get the correct quantities of medical supplies at the right time. One potential area for collaboration is to develop a pathway and framework for states to procure, test, and validate technology and other medical products. Madhya Pradesh, Punjab, and Rajasthan all mentioned a need to better identify an accurate pricing point for both equipment and services for sustainable and affordable health care.

The state of Madhya Pradesh expressed an interest in partnering to procure and scale innovations, particularly in developing action plans and frameworks to test and validate technology and medical products. Officials in the state are also interested in assistance with making sure that they have the correct quantity of appropriate medications on hand at the right time.

The state of Bihar is interested in identifying a partner to create a financial management system for state expenditures to help manage and expedite the disbursal of funds.

Health Care Areas/Populations

Top health priorities include non-communicable diseases (NCDs), RMNCH, and communicable diseases. States consistently looked to strengthen primary and preventative services and improve care for the most vulnerable, disadvantaged populations. Women and children are the most targeted demographic for health services (Punjab, Karnataka, Goa, Maharashtra, Uttarakhand, Jammu and Kashmir, Tamil Nadu, Rajasthan, Telangana, Nagaland, Himachal Pradesh, Gujarat, Haryana, and Tripura). Elderly populations were also cited as a demographic needing assistance through geriatric (Punjab, Tamil Nadu, and Kerala) and palliative care (Telangana and Kerala). Other marginalized groups include Scheduled Castes and Scheduled Tribes (e.g., Adivasi) or economically disempowered groups, such as fisherman and farmers. The chart below provides a summary of the priority areas highlighted by state health care leaders in this area.

Priorities	Non-Communicable Diseases	Communicable Diseases	Reproductive, maternal, newborn & child	Social Determinants of Health	Acute Care	Mental and Behavioral Health
Bihar			X	X		
Chhattisgarh	X	X	X	X		
Punjab	X	X	X	X		
Gujarat	X	X	X	X		X
Jammu and Kashmir	X		X			
Jharkhand	X	X	X	X		X
Karnataka	X	X	X		X	X
Kerala	X	X	X	X	X	X
Maharashtra	X	X	X	X		X
Madhya Pradesh				X		
Nagaland	X	X	X	X		X
Odisha	X	X	X	X	X	X
Tamil Nadu	X	X	X	X	X	X
Telangana	X	X	X	X		X
Uttarakhand	X		X			X
Uttar Pradesh		X				
Rajasthan	X	X		X	X	
West Bengal		X				

Non-Communicable Diseases

NCDs are a chief concern for both national and state health care leaders. In 2016, cardiovascular diseases, respiratory diseases, and diabetes together accounted for four million deaths annually.[14] In states with higher NCD burdens (e.g., Tamil Nadu, Punjab, and Maharashtra) cardiovascular, chronic obstructive pulmonary disease, diabetes, and cancer are the primary focus. To help thwart the advance of NCDs, several states (Gujarat, Punjab, Rajasthan, and Telangana) identified a need to bolster primary and preventative care.

SUCCESSES IN HEALTH AREAS

Operation ASHA is a nonprofit organization focused on bringing tuberculosis (TB) treatment to disadvantaged communities. The group works closely with the National TB Programs in India to prevent and treat tuberculosis by establishing TB treatment centers within existing community centers such as shops, homes, temples or health clinics. Their system is designed to help make TB treatment easy, inexpensive, and convenient for patients. Operation ASHA works in eight states and serves 4.37 million people.

Communicable Diseases

Despite the ongoing epidemiological health transition, communicable diseases remain a top priority for several states. Types of diseases varied, with TB and vector borne diseases cited most frequently. Other diseases include measles-mumps-rubella (Himachal Pradesh and Kerala), diarrheal disease (Bihar and Haryana), neglected tropical diseases like visceral leishmaniosis (Bihar); and water and vector borne disease like malaria (Haryana, Kerala, and Uttar Pradesh).

Reproductive, Maternal, Neonatal, and Child Health

RMNCH is a top priority for most states. Maternal and child mortality remains higher in India than the global average, with 15% of all maternal deaths occurring there.[15],[16] States are interested in exploring new opportunities and interventions to continue to reduce mortality rates. They have taken different approaches in the past and remain open to innovation. Examples of past approaches include: infant screening tools (Goa), reducing fertility rates (Gujarat, Uttarakhand), increasing the rate of institutional deliveries (Nagaland), reducing barriers to care such as transportation or costs of public facilities (Telangana), focusing on improving post-natal care for high-risk pregnancies (Telangana), or developing family planning tools (Telangana and Bihar).

Socioeconomic Determinants of Health

Stakeholders identified a range of health-related issues that broadly fall under the category of socioeconomic determinants of health. Common health priorities to address include malnutrition, improving the physical environment, strengthening community linkages, and increasing physical access to care. Though the majority of malnutrition cases are concentrated in Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, Maharashtra, and Tamil Nadu, the issue remains endemic to other states, ranking highly even in states with better nutrition rates, such as Punjab, Tripura, Nagaland, and Telangana.[17] Due to the complexities of malnutrition and its cyclical effects, states are also focusing on related issues like anemia (Madhya Pradesh), low birth weight (Rajasthan), food adulteration (Rajasthan), and the nutritional status of mothers (Tripura).

States are also focusing on upstream factors like the built environment. For instance, Rajasthan mentioned the need to address sewage and agricultural waste. Policy documents in several states, such as Kerala, suggest that air-quality related issues like asthma may be a higher priority than identified in interviews.[18]

Mental and Behavioral

A majority of the states interviewed would like to better address mental and behavioral health. Historically neglected, these issues have begun to receive more attention lately. Areas of focus include suicide, depression, and substance abuse. Stakeholders also prioritized a need to better engage individuals to induce positive behavioral changes through actions such as promoting healthy lifestyles (Nagaland), encouraging patients to receive treatment at more appropriate facilities like primary health centers instead of tertiary care facilities (Chhattisgarh), and using patient education to encourage individuals to seek care proactively (Punjab).

Potential Partnerships: Health Care Areas

Requests for partnerships in specific health areas varied by state, with several states focusing on a need to identify risk factors to reduce the incidence of communicable diseases. Explicit requests include:

- Odisha: Assistance in developing primary health centers in remote and tribal areas and partnering to map health deficiencies by geography
- Bihar: Development of new family planning tools that can leverage social media or other technologies to improve patient education and empower women

Conclusion

As India continues along the path of decentralization, states are beginning to have an outsized role in shaping health care. International institutions looking to collaborate in the health care space should therefore consider opportunities for engagement at the sub-national level. Yet differing health needs, capacities, and political circumstances across states create uneven opportunities for partnership. While not exhaustive, these initial findings illustrate an abundance of avenues for engagement—from technical skills training to supply chain management assistance. Despite the diversity of options, several cross-cutting trends exist. Most notably, a wide-scale epidemiological transition coupled with rapid urbanization is shifting state priorities from infectious diseases to non-communicable diseases. Simultaneously, technological developments and a resurgence of nationalism are driving states to focus on scaling domestic technologies and delivery innovations. While major health reforms like Ayushman Bharat may catalyze new opportunities for engagement, the verdict is out on how reforms will impact care on the ground. In the interim, this report can serve as a guide for external actors looking to identify ripe partnerships to improve health care in India.

Appendix One | State Health Care Priorities

As part of Phase One of the Indian States Healthcare Innovation Partnerships project, state leaders were asked to complete a matrix highlighting their priorities in various health care realms. The chart below provides the compiled results of these surveys.

Category	Priorities	Bihar	Chhattisgarh	Punjab	Gujarat	Jammu and Kashmir	Jharkhand	Karnataka	Kerala	Maharashtra	Madhya Pradesh	Nagaland	Odisha	Tamil Nadu	Telangana	Uttarakhand	Uttar Pradesh	Rajasthan	West Bengal
Financing and Payment	Budget Allocation	X				X		X				X						X	
Financing and Payment	Procurement, Strategic Purchasing					X	X	X	X		X	X						X	
Financing and Payment	Pooling Financial Risk							X	X										
Financing and Payment	Provider Payments			X				X	X	X	X	X							
Financing and Payment	Raising revenue							X											
Financing and Payment	Financing for UHC or primary care		X					X	X	X	X								
Financing and Payment	Donor versus domestic financing										X				X				
Financing and Payment	Overall health financing reform							X	X		X				X				
Organizational Delivery	Expanding Access			X				X			X			X				X	
Organizational Delivery	Data Management	X		X		X	X	X	X	X	X	X		X	X			X	
Organizational Delivery	Outcomes-Based Measurement							X	X		X	X		X	X				
Organizational Delivery	Data Types					X						X							
Organizational Delivery	Patient Engagement	X		X									X		X			X	
Organizational Delivery	Delivery Models	X	X	X		X	X	X	X			X			X				X
Organizational Delivery	Leadership and Governance			X				X	X			X						X	
Organizational Delivery	Private sector								X										X
Capacity	Infrastructure		X			X				X	X	X		X	X		X		X
Capacity	Pharmaceuticals or devices			X		X	X	X		X	X	X	X		X	X	X		
Capacity	Information Technology		X				X	X	X			X	X	X	X	X			
Capacity	Partnerships/ Collaboration		X					X							X		X		
Capacity	Workforce	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X
Regulatory	Workforce			X				X			X							X	
Regulatory	Medicines and Technologies						X				X								
Regulatory	Enforcement																		
Regulatory	Financial		X				X				X								
Health Areas	Non-Communicable Diseases		X	X	X	X	X	X	X	X		X	X	X	X	X		X	
Health Areas	Communicable Diseases		X	X	X		X	X	X	X		X	X	X	X		X	X	X
Health Areas	Reproductive, maternal, newborn and child	X	X	X	X	X	X	X	X	X		X	X	X	X	X			
Health Areas	Social Determinants of Health	X	X	X	X		X		X	X	X	X	X	X	X			X	
Health Areas	Acute Care							X	X				X	X				X	
Health Areas	Mental and Behavioral Health				X		X	X	X	X		X	X	X	X	X			

About the Project Directors & Authors

Richard Rossow is a senior adviser and holds the Wadhwani Chair in U.S.-India Policy Studies at CSIS. In this role he helps frame and shape policies to promote greater business and economic engagement between the two countries. He joined CSIS in 2014, having spent the last 16 years working in a variety of capacities to strengthen the partnership between the United States and India.

Dr. Kartikeya Singh is a senior fellow at CSIS and the deputy director of the Wadhwani Chair in U.S. – India Policy Studies. Over the last two years he has been leading the center's work on engagement with India's states. Aside from his pioneering work connecting U.S. and Indian states on energy cooperation, Kartikeya has led the charge in shaping the Hans and Ford Foundation supported Indian States Health Innovation Partnership project. He holds a doctorate in international affairs from the Fletcher School of Law & Diplomacy, and a master's degree in environmental science from the Yale School of Forestry & Environmental Studies.

Dr. Krishna Udayakumar is the founding director of the Duke Global Health Innovation Center, focused on generating deeper evidence and support for the study, scaling, and adaptation of health innovations and policy reforms globally. He is also Executive Director of Innovations in Healthcare, a non-profit co-founded by Duke, McKinsey & Company, and the World Economic Forum, leading the organization's work to curate and scale the impact of transformative health solutions globally. At Duke University, Dr. Udayakumar holds the rank of Associate Professor of Global Health and Medicine and is Associate Professor at Duke-NUS Medical School Singapore. His work has been published in leading academic journals such as the New England Journal of Medicine, Health Affairs, and Academic Medicine. Dr. Udayakumar is a Phi Beta Kappa graduate of the University of Virginia, with a bachelor's degree in interdisciplinary studies with distinction. He received both an MD and an MBA (with a concentration in Health Sector Management) from Duke University, where he was a Fuqua Scholar. Dr. Udayakumar completed his residency training in internal medicine at Duke and served as Assistant Chief Resident at the Durham VA Medical Center before joining the faculty of Duke University.

Christa Twyford Gibson leads a team in the development, design, and delivery of programs focused on linking policy with innovation to solve global health challenges in her role within the Duke Global Health Innovation Center and Innovations in Healthcare, At

Duke, Christa has developed and managed a wide range of programs under the Senior Vice President for Public Affairs and Government Relations, the Vice President for Durham and Regional Affairs, and within the School of Medicine. Internationally, Christa has worked in Bulgaria, as a United States Peace Corps Volunteer; in Central Asia, as a senior advisor for a regional health systems strengthening project; and in Latin America, as a global health consultant. Christa is conversant in Russian, German, and Spanish and has basic French, Bulgarian, and Tajik language skills. She earned a Master of Public Policy from Duke University's Sanford School of Public Policy and a Bachelor of Arts in German language and literature from the University of South Carolina.

Jonathan Gonzalez-Smith is a member of Duke-Margolis' Global team, which collaborates closely with Innovations in Healthcare and the Duke Global Health Innovation Center, researching international models of accountable care, health financing, global health innovation, and payment and delivery reform. Primary and secondary research and statistical analysis are the focus of much of his work. Jonathan holds a Master's in Public Affairs from the University of Texas and BA in philosophy and international relations from Northwestern University.

Nicole Davis is a member of the Duke Global Health Innovation Center and Innovations in Healthcare Programs team. She works on a variety of projects in countries across Africa, in India, and in the United States. Her research has focused on health financing, data protection, and global health innovation. Nicole holds Bachelor of Arts degrees in anthropology and peace, war, and defense from the University of North Carolina at Chapel Hill.

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