MODEL DISTRICTS AS A ROADMAP FOR PUBLIC HEALTH SCALE-UP IN INDIA

Nirupam Bajpai, Megan Towle, and Jyothi Vynatheya

Working Paper No. 4
July 2011

WORKING PAPERS SERIES
Columbia Global Centers | South Asia, Columbia University
Express Towers 11th Floor, Nariman Point, Mumbai 400021
globalcenters.columbia.edu/southasia/
ABSTRACT
While India has experienced some improvements in health indicators in recent years, the country still has the highest burden of poor reproductive and child health in the world. Public investment in primary health care must increase to achieve health targets, and the health system needs to be reformed to ensure efficient and effective delivery of high quality health services. While the Government of India’s National Rural Health Mission (NRHM), launched in 2005, has made great strides in improving access to quality primary healthcare in rural areas, significant gaps remain.

The Model Districts project is a joint initiative between the Earth Institute and the Ministry of Health and Family Welfare, Government of India, with aims to demonstrate what health and nutrition interventions are needed to narrow policy-practice gaps in NRHM in five regionally representative districts across India. The project’s strategy is to target interventions and additional public health spending at the intersection of the six building blocks of health systems strengthening (financing, governance, supply chain management, health human resources, infrastructure, and data management) and five areas along the continuum of care for mothers and children (antenatal care, safe delivery, immediate postnatal care, early childhood development and nutrition, and routine and sick child care). The Model Districts scale-up model is supported by a robust baseline and monitoring and evaluation plan, interventions pilots at the block level, growth expansion to the district based on learning exchanges within and across districts, and finally national level scale-up through policy adaptation and replication.

This working paper signifies the beginning of the Model Districts project’s contribution to growing research on the health systems strengthening requirements for rural India, intended for use in policy-making and health-programming.
INTRODUCTION
India’s on-going struggle to provide high-quality public health services, particularly for the rural masses, is one of the country’s greatest challenges. The National Rural Health Mission (NRHM) was launched in 2005 as a flagship programme of the Ministry of Health and Family Welfare (MOHFW), Government of India, with aims to improve access to quality health care for the rural population, and especially the poor, women, and children. At the request of the Minister of Health and Family Welfare, the Earth Institute at Columbia University has been convening an International Advisory Panel (IAP) that meets biannually to review Mission progress and advise on international best practices relevant to rural India. The Earth Institute conducted a mid-term evaluation of NRHM, which demonstrated that coverage of high-priority interventions remains inadequate, programming quality is insufficient, efficient management and governance is lagging, and deplorable inequities further complicate delivery and uptake (Paul et al. 2011, Bajpai et al. 2009). Corrective action is required immediately to accelerate progress towards national and Millennium Development goals in health. The MOHFW and the IAP determined that required efforts in health systems strengthening would best be piloted and scaled-up as regional models, given India’s size and the wide variances in health system performance, disease burden, and sociocultural, political, economic contexts. The MOHFW and Earth Institute selected states from each geographical region: Assam (Northeast), Bihar (East), UP (North), Rajasthan (West), and Andhra Pradesh (South), and further selected 1 a district within each state.

These five Model Districts will serve as regional pilots for scaling up innovations and quality improvements in the six health system building blocks: financing, leadership and governance, supply chain management, human resources for health, infrastructure, and health information management systems. By targeting active management and improved delivery processes within these six areas of the system, the project aims to enhance the quality of, and access to, health services delivery for the continuum of maternal and child health care, including antenatal care, safe delivery, immediate postnatal care, early childhood development and nutrition, and care for the well and sick child. With this strategy, the Model Districts will seek to create ‘centres of excellence’ for the issues in designing, managing, and implementing scaled-up health systems, particularly in large rural areas and with a focus on maternal and child health and nutrition.

In this paper we will briefly explain how the MOHFW and The Earth Institute arrived at the need for the Model Districts initiative 3, the project’s proposed strategy for narrowing the policy-practice gaps and scaling-up required best practices and innovations, and the expected outcomes and impact of the project. This working paper, and continued research work during the course of the project, seeks to contribute to the growing discussions around the health systems strengthening requirements for India’s rural public health services, for use by policy makers, programme managers, and health researchers.

BACKGROUND
While India has experienced strong economic growth in the past two decades, and has made some progress towards poverty and education Millennium Development goals, healthcare goals have lagged significantly with unacceptably high rates of maternal mortality, infant mortality, and

---

1 District selection criteria included: rural (urbanization <20%), accessibility from the capital city, and poor primary health indicators.

2 Designated Model Districts are: Morigaon, Assam; Unnao, Uttar Pradesh; Dausa, Rajasthan; Jehanabad, Bihar; Medak, Andhra Pradesh. The cumulative population of these districts, according to the 2011 Census, is 9.86 million. See Annex for a map of the five districts.

3 The Model Districts research team is generously supported by the IKEA Foundation, with appreciation due to Per Heggenes, Marianne Barner, and Vandana Varma.
undernutrition (Table 1). These poor health indicators are driven by low rates of institutional delivery, poor quality ante- and postnatal care, and inadequate or mismanaged child health interventions. India’s sheer size impacts the entire South Asian region’s performance and gives the country particular importance.

<table>
<thead>
<tr>
<th>MILLENNIUM DEVELOPMENT GOAL TARGET</th>
<th>BASELINE</th>
<th>CURRENT</th>
<th>BY 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the proportion of children moderately or severely underweight by half</td>
<td>53% (1993)*</td>
<td>43% (2006)*</td>
<td>&lt;27%</td>
</tr>
<tr>
<td>Reduce under-5 mortality rate per 1,000 children by 2/3</td>
<td>118 (1990)*</td>
<td>69 (2008)*</td>
<td>&lt;38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63 (2010)*</td>
<td></td>
</tr>
<tr>
<td>Reduce infant mortality rate per 1,000 live births by 2/3</td>
<td>83 (1990)*</td>
<td>52 (2008)*</td>
<td>&lt;30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 (2009)*</td>
<td></td>
</tr>
<tr>
<td>Increase proportion of children under 12 months immunized against measles to 75%</td>
<td>56% (1990)*</td>
<td>70% (2008)*</td>
<td>75%</td>
</tr>
<tr>
<td>Reduce maternal mortality rate per 100,000 live births by ¾</td>
<td>570 (1990)*</td>
<td>450 (2006)*</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Increase proportion of (rural) births attended by skilled health personnel</td>
<td>-</td>
<td>43.6% (2008)*</td>
<td>&gt;80%</td>
</tr>
</tbody>
</table>

**Table 1. India’s progress towards Millennium Development Goals 1, 4, and 5 targets.**

Child health indicators in India are particularly dismal. One in every 15 children in India dies before s/he reaches her/his fifth birthday, totalling 1.8 million children a year (World Bank 2009). Eight states contribute to 75% of infant mortality; the five Model District are within these states (UNICEF 2008). A third to half of all childhood deaths in India are related to malnutrition; about 30% of children are born low birthweight, and rates of malnourishment peak before two years of age (Jones et al 2006, Black et al 2010, Paul et al 2011). Forty-four percent of Indian children under five are underweight and 48% stunted due to chronic malnutrition; this means India is home to 46% of the world’s underweight children and 32% of the world’s stunted children (NFHS-III, UNICEF 2009). Children with severe acute malnutrition are not addressed. Nearly 30% of the global childhood deaths attributed to stunting, severe wasting, and low birthweight occur in India—a total of 24.6 million disability-adjusted life years (DALY) (Black et al. 2010).

Poor child health indicators are a reflection of many system failures, including poor maternal health care. India has the highest number of maternal deaths in the world. The national maternal mortality rate (MMR) is 254 per 100,000 live births, an absolute number of 68,000 per year. Comparatively, China’s MMR is 45 (UNICEF 2008). There is disparity between states, and some states far exceed national MMR, including Assam (480) and Uttar Pradesh (440) (SRS 2004-06). More than two-thirds of all maternal deaths occur in nine states, four of which have designated Model Districts (UNICEF 2009). The majority of deaths are preventable through safe deliveries and

---

5 National infant mortality targets: National Population Policy (2000) and NRHM set goal of <30 per 1,000 live births by 2010; the National XI Plan sets 28 per 1,000 live births by 2012. It appears that none of these goals will be reached in rural India, even by 2015.
6 National neonatal mortality targets: National Plan of Action for Children (2005) set goal of <18 neonatal deaths per 1,000 live births by 2010; current status is 35 deaths per 1,000 live births (2008).
7 National MMR targets: National Population Policy (2000) and NRHM’s goal is <100 per 100,000 live births by 2010.
8 These states include Uttar Pradesh, Uttarakhand, Bihar, Jharkand, Orissa, Madhya Pradesh, Chhattisgarh, Rajasthan and Assam.
adequate maternal care. However, only 52.7% of women have a safe delivery.\(^9\) Less than 20% had full antenatal care, which includes at least three antenatal care visits, one tetanus toxoid shot, and the recommended dose of iron supplementation (DLHS-III). Over half of married women are anaemic, and one third of women are underweight (NFHS-III). India is also marked by particularly high unmet need for contraception, rampant unsafe abortion, young pregnancies (30% of women deliver before the age of 20), and minimal reproductive health support for younger women (Paul et al. 2011).

**Need for scale-up of primary health services**

Rural areas in a number of Indian states have long had extremely poor primary healthcare infrastructure, both in regards to quality and coverage. A massive scale-up effort was required to provide adequate quantity, and improve quality, of primary healthcare in these states. The Earth Institute at Columbia University and the Indian Institute of Management at Ahmedabad conducted a detailed costing exercise in six states to estimate scale-up requirements to provide primary care services to the entire rural population; at this time public health spending had not exceeded 0.9% GDP (Bajpai et al. 2005, Bajpai and Dholakia 2006, Bajpai et al. 2007, Bajpai et al. 2008). These papers joined a rising call in the early 2000s for India to commit more significant expenditures and operational bandwidth to creating a revived public health system for rural India, and particularly one that reached the most vulnerable pockets of population, including the poor, women, children, and other marginalized groups.

**The National Rural Health Mission**

The Prime Minister of India launched the National Rural Health Mission (NRHM) on 12 April 2005, in an effort to improve public health service delivery, and particularly in 18 high-focus states\(^10\) with weak infrastructure and poor health indicators. The Mission seeks to bridge significant urban-rural health disparities by improving access to quality primary health services, particularly for those living in rural areas, women and children, and the poor. NRHM is undoubtedly the most ambitious rural health initiative in post-independent India; the United Progressive Alliance (UPA) of various political parties launched the Mission as part of their post-2004 elections Common Minimum Program. NRHM’s seven year time frame (2005-06 to 2011-12) spans both the Tenth Five Year Plan (2002-2007) and the Eleventh Five Year Plan (2007-2012).

The Mission’s services would target established critical care interventions in defined high-focus districts in an effort to drive equitable, affordable, accountable, and effective primary health care. NRHM’s strategy is driven by the principles of ‘Health for All’, such as equitable distribution, decentralized planning, intersectoral collaboration, community participation, and use of technology. The Mission’s vision set to provide effective health services to the rural masses by:

- ensuring that the central government raises public health spending from 0.9% GDP to 2-3% of GDP\(^11\), and creating new financing mechanisms, including facility-based funding for spending flexibility;
- promoting policies and institutional mechanisms that strengthen decentralized public health management and service delivery in the country, particularly to district-level planning, and village-level engagement driven by the Panchayat Raj Institutions (PRIs) and Panchayat members’ involvement in Village Health and Sanitation Committees (VHSC);
- strengthening facility infrastructure and capacity to increase, and meet, local demand;

\(^9\) A safe delivery is defined as one in an institution or at home attended by skilled health professional.

\(^10\) NRHM high-focus states include: Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttar Pradesh, and Uttarakhand. All states in India’s Northeast region are high-focus; these states account for eight of the 18 total high-focus states nationally. In these high-focus states, 264 districts have been designated high-focus.

\(^11\) Prior to launching NRHM in 2005, India’s public health expenditures were 0.9% GDP. Current health spending is under 1.5% GDP. Health Minister Azad reported in May 2011 that health spending will likely increase to 2-3% GDP in the 12th Plan.
(d) ensuring household- and village-level health services access by installing a community Accredited Social Health Activist (ASHA) and strengthen sub-centres;  
(e) driving the convergence of hygiene, sanitation, nutrition, local health traditions, and disease control programmes within NRHM;  
(f) emphasizing the collection and use of health data in decision-making and planning; and  
(g) ensuring public-private partnerships to achieve public health goals;  

**Current health services in India**  
In 2009 the Ministry of Health and Family Welfare (MOHFW) commissioned an independent mid-term evaluation of NRHM conducted by The Earth Institute-Columbia University (Bajpai, Sachs, and Dholakia 2009). The evaluation recognized that NRHM had achieved commendable progress in a number of areas, including the creation of ASHA per every 1000 population; creation of greater community awareness around antenatal care, institutional delivery, and child immunization; the increase in the number of mothers seeking institutional delivery and outpatient care in the health system; and the provision of untied funds to all facility levels to encourage decentralized management and quality improvements.

The evaluation recommended that seven broad issues must be addressed if NRHM was to succeed at scale:  
1. The system required much higher public health spending, and higher outlays in particular for NRHM.  
2. ASHAs required proper recruitment, comprehensive training (e.g. full induction, on-the-job, and regular refresher), effective oversight, and payments that are timely and adequate.  
3. Efficient and effective management structures are required for all health facilities at village, block, and district levels, as administrative duties are often overlooked or poorly managed due to lack of capacity.  
4. The village-level Panchayat Raj Institutions (PRIs) require a concrete role in NRHM, and the Panchayat members should receive on-going training for this role.  
5. Sub-centers and primary health centers require commensurate physical infrastructure and human resources as local demand grows.  
6. NRHM must focus on scaling up high-impact, critical care interventions to target the persistently high infant mortality rate (IMR), especially neonatal mortality, and the maternal mortality rate (MMR).  
7. NRHM must be better integrated with nutrition programming, working especially closely with the Anganwadi workers of the Integrated Child Development Services (ICDS).  

---

12 This includes Ayurveda, Yoga, Unani, Sidha and Homeopathic (AYUSH) treatments.

13 A number of these issues reiterated preliminary research on requirements for NRHM (e.g. Satpathy and Venkatesh 2006), and a 2011 Lancet series on universal primary healthcare in India echoed the NRHM mid-term evaluation, repeatedly called for tighter management, better use of information, increased spending, and re-focused, high-impact interventions (e.g. neonatal care, nutrition programming, access to treatment for diarrhoea and pneumonia) in order to create an effective and equitable public health system (Horton and Das 2011; Paul et al. 2011a). The series notes inadequacies in planning, financing, human resources, infrastructure, supply chains, information use, governance, and monitoring, and calls for a transformation of the health system by further decentralizing management to district-level, implementing tools for active management, initiating reasonable demand-side financing, and large-scale campaigning towards behaviour change and the creation of a people’s movement around universal primary healthcare (Chatterjee 2011; Paul et al. 2011a, 2011b).

14 Further recent research (e.g. NHRSC 2011; Bajpai and Dholakia 2011) echoes the mid-term evaluation’s results and recommendations, calling for mechanisms for active performance management of ASHA, full-time training structures that ensure high-quality training and support, on-the-job support and regular supervision, opportunities for career growth, and increased incentives (both financial and non) to motivate the ASHA workforce.

15 Neonatal mortality is a death occurring between the first 28 days of life. The neonatal mortality rate (NMR) is the number of neonatal deaths per 1,000 live births. Neonatal deaths contribute to more than half of all childhood deaths (Black et al 2010).
The case for regional models of scale-up

The mid-term NRHM evaluation emphasized that the burden of health challenges, and the coverage of key NRHM interventions trying to address them, varies widely throughout India (Figure 1).

FIGURE 1. Coverage of key reproductive, maternal, and child interventions throughout India

<table>
<thead>
<tr>
<th>Women receiving complete ANC</th>
<th>Institutional delivery rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>National rate is 19%</td>
<td>National rate is 47%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children (12-23 months) fully immunized</th>
<th>Women using any family planning method</th>
</tr>
</thead>
<tbody>
<tr>
<td>National rate is 54%</td>
<td>National rate is 54%</td>
</tr>
</tbody>
</table>


The mid-term evaluation results also highlighted the significant need for health systems strengthening in order to optimize NRHM scale-up. In an August 2009 meeting of the International Advisory Panel, the concept of Model Districts were proposed as models for scale-up of best practices that target region-specific factors for poor health outcomes. As an initiative in health systems strengthening, the Model Districts would focus on ensuring that the critical building blocks for an effective health system—governance, financing, human resources, service delivery, health

16 Convergence between health and nutrition sectors has long been a concern for governance and effective programming in India, and Model Districts will be further targeting specific recommendations as laid out in recent research (Bajpai and Dholakia 2011b; Paul et al. 2011; Gupta and Khaira 2008)

17 The International Advisory Panel (IAP) is a biannual meeting convened annually between the Minister of Health and Family Welfare and a group of international health experts, led by The Earth Institute of Columbia University. The IAP was created at the Ministry’s request in 2006, and as of August 2011, the IAP has held ten meetings with key stakeholders to discuss NRHM operations, emerging health systems challenges, and opportunities of the implementation of best practices in India.
technology, and health information support—have the linkages and capacity to provide quality health services and meet health system goals.¹⁸

As an advisory project, the Model Districts project would seek to demonstrate that targeted additional expenditures, programmatic innovations, and applied best practices can improve NRHM service delivery and efficiency, and maternal and child health outcomes. District and state governments would be fully responsible for implementation, management, and funding; the Model Districts research team would provide technical advice and operations research, in order to champion additional funding and evidence-based policy recommendations at state and national levels. This concept was finalized during a meeting with representatives from the MOHFW, The Earth Institute, and state officials from selected Model Districts’ states in October 2009.

MODEL DISTRICTS PROJECT APPROACH

The Model Districts project (MD) launched as a joint initiative between the Earth Institute and the MOHFW with aims to demonstrate the health and nutrition interventions needed to narrow policy-practice gaps in NRHM. As conceptualized, the Model Districts project has particularly strong added value because it has enthusiastic buy-in from national, state, and district officials. The government has committed to additional health spending for improvements in these districts, and the lessons learned from the project will be directly translated into policy recommendations for state and national health officials. Project findings will be documented as best-practices research to contribute to the lacking evidence base on NRHM and ICDS reform as well as being translated into policy briefs for use by district, state, and national governments. A project like this, of this scale, is unprecedented in the area of public health in India.

The 5-district model

The Model Districts project is a unique model for regional and national scale-up of best practices for maternal and child health, and nutrition programming. The project plans to target operations in the following five regionally representative districts: Morigaon, Assam (Northeast), Jehanabad, Bihar (East), Unnao, Uttar Pradesh (North), Dausa, Rajasthan (West), and Medak, Andhra Pradesh (South).¹⁹ Districts were deliberately chosen as the model unit for operations because districts represent the most aggregate sub-state units of governance in India, including planning, budgeting, and managing across all sectors (e.g. health, education, water, sanitation, electricity, nutrition, etc.). Alternatively, villages are too small and too numerous to make for representative models due to the large scale of India’s population.

These districts were selected to represent five major regions because each will present varied issues in service delivery that require distinct solutions, but there will also be a considerable amount of overlap in learnings from each of our districts. Operating in five districts simultaneously will steepen our learning curve and allow us to avoid thinking in a silo where our perspective is limited to the narrow scope of one state. This enables the project to more efficiently apply best practices and innovations of one district to another, thus speeding progress. There will be a number of forums for

¹⁸ Health systems strengthening focuses on all actors, institutions, and resources that act towards improving, restoring, or maintaining health outcomes and reducing health inequities (WHO 2007). These actions include efforts to create health-enabling environments, facilitate health-seeking behaviours, or provide more direct activities to improve health. Thereby, health systems are more than only publically-run facilities, but would also include a mother caring for her child at home, community change agents for health, behaviour change programmes, sanitation and hygiene initiatives, vector and disease control programmes, nutrition and food security efforts, among others (WHO 2007).

¹⁹ Morigaon was launched as a Model Districts in September 2010, including a state-level launch event chaired by the Chief Minister and a district-level launch by the District Collector and 700 attendees. Unnao was launched by the District Magistrate and district-level officials in April 2011. Dausa, Jehanabad, and Medak are slated to launch in the fourth quarter of 2011.
sharing lessons and research results from across districts, including the International Advisory Panel meetings with the MOHFW. Findings and recommendations presented to the MOHFW will hold more weight and will have a greater implication on national-level policies if they are representative of the perspectives of five major regions in the country.

Strategic framework

The following conceptual framework forms the strategic foundation of the Model Districts Project. This framework will be used to map out the policy-practice gaps in each state and to determine outputs that seek to strengthen the six building blocks of health systems at the intersection of each focus area on the continuum of maternal and child health (Figure 2). The Model Districts project will follow a two-step process within the health systems strengthening approach. First, a needs assessment and baseline study will systematically map the gaps and constraints within each health system building block, as they apply to the ability of the system to deliver efficient, effective, and equitable services along the mother-child care continuum.

After these policy-practice gaps have been identified with the use of the developed strategic framework, the Model Districts team and district officials aim to strengthen system capacity and improve community level management to meet charted outcomes and targeted areas within each intersection of the strategic framework (e.g. the supply requirements for providing quality antenatal care, or the infrastructural requirements to providing safe delivery). Targeted interventions, including best practices and piloted innovations, will be implemented within the six blocks of health systems strengthening that have been identified to be most relevant to and aligned with the NRHM structure.

The critical building blocks of health systems provide a useful structure for mapping policy-practice gaps, and designing required corrective strategies. First, improvements in infrastructure, including facility quality improvements and upgrades to Indian Public Health Standards (IPHS), are necessary to ensure that health institutions are capable of stimulating demand for and providing high quality health service delivery (MOHFW 2010). Second, an efficient and effective protocol for collection, analysis, and dissemination of data is necessary for a well-functioning health information system; as such, a streamlined real-time data management system is required to enable data-driven decision making and health planning.

Third, intersectoral leadership teams at block and district levels must have the political will and intelligence to define, refine, and enforce technical policies, collaborate across sectors, be accountable and transparent, and be equipped to use real-time data and best practices for health planning. Fourth, a strong health financing system must be in place to ensure provision and coverage of health services. Fifth, a health system must be able to provide uninterrupted access to essential medicines and technologies, and as a result the creation of a procurement and supply chain management system is a key component of systems strengthening. Lastly, even with the physical infrastructure, correct technical policies, and funding streams in place within the health system, service delivery cannot be optimized without a focused effort to build frontline health worker capacity. The Model Districts initiative will focus on performance management, full-time quality training structures, adequate coverage, mentoring and support, and incentives (e.g. financial and otherwise) to motivate and improve health worker performance. Each of these building blocks is inextricably linked to one another, and the system requires strengthening within each area to function efficiently, effectively, and transparently.

---

20 See Annex for targeted critical care interventions in maternal and child health.
Targeted interventions within the Model Districts project will intersect the above six building blocks of health systems and the five core areas along the continuum of maternal and child health: antenatal care, delivery, postnatal care, early childhood development and nutrition, and routine and sick child care. To ensure each of the above outcomes of health service delivery, gaps must be plugged within each of the above health systems building blocks. These gaps will be identified and critical areas of intervention will be mapped out using the above conceptual framework matrix.

The methods of scale-up
The Model Districts scale-up model suggests a three-pronged approach to initiating change with the Indian health system. It aims to:

1. **Strengthen key health system components**: A rigorous situation analysis will guide the development of specific pilot interventions that target the policy-practice gap to ensure provision of key services at health facilities at required capacity levels.

Pilot and scale-up interventions can seek several dimensions of scale-up. The Model Districts scope will focus on enhancing three such dimensions: (a) geographic coverage, (b) breadth of coverage, and (c) depth of services. First, geographic coverage stresses a particular focus on inaccessible, difficult to reach areas. For example, operations in the pilot block in the Morigaon Model District will target service coverage in riverine islands and regions impacted by frequent flooding.
block level (administrative units of approximately 30 to 50 health facilities). Pilots will focus on: (a) technical innovations, (b) process innovations, particularly in governance, (c) capacity building and performance management, and (d) better integrating best practices into existing service delivery approaches. Pilot interventions must be feasible, and of targeted scope, to later operate at-scale within NRHM (Table 2).

2. **Stimulate the exchange of best practices:** A system of wider learning exchange will ensure a continual refinement of the project model and of interventions being piloted within the project. Cross-district working groups will be initiated to share innovations and best practices that can be leveraged from one model district to another. Lessons learned from piloted interventions will guide district level scale-up. India-wide working groups comprised of technical leaders in the field will ensure that the most current gold standards and existing resources are being applied to Model Districts operations. Strategic partners will be engaged in funding, implementation, and technical support at local levels to ensure sustainability and scalability. Furthermore, robust monitoring within each district, with real-time analyses, will inform strategy review and impact assessments. Research contributions to the public health literature body will build out the evidence base for targeted improvements in health systems that can be applicable to other states within India and to other developing countries.

3. **Scale-up by policy adaptation and replication:** The research team from Columbia will be presenting results from Model Districts and evidence-based policy recommendations during regular meetings with state health officials, biannual meetings with the MOHFW during the IAP, and additional meetings with the Prime Minister’s Office. Policy recommendations at the state and national levels will have a strong focus on the additional, targeted public spending requirements for each recommendation. Furthermore, this project follows a unique model in order to ensure sustainability beyond the years of the specific engagement. As the Model Districts Project was commissioned at the specific request of the Ministry of Health and Family Welfare, it ensures buy-in and funding towards this project. For the sole purpose of ensuring that no innovations created within the Model Districts ceases in 2015, the project has an agreement with the government to bring in research, technical expertise, and platforms upon which rural health systems can thrive, but that all implementation and on-going costs of interventions will be

---

**TABLE 2. Criteria for viability of innovations and best practices piloted at block level.**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Credible and evidence-based</td>
</tr>
<tr>
<td>2.</td>
<td>Observable to ensure those implementing, monitoring, and accessing can see results in practice</td>
</tr>
<tr>
<td>3.</td>
<td>Positive cost-benefit over existing practices</td>
</tr>
<tr>
<td>4.</td>
<td>Relevant to most persistent or severe problems</td>
</tr>
<tr>
<td>5.</td>
<td>Compatible with existing NRHM structures</td>
</tr>
<tr>
<td>6.</td>
<td>Easy to transfer and adopt at district level</td>
</tr>
<tr>
<td>7.</td>
<td>Testable in pilot form at block/district, without requiring full adoption before results are established</td>
</tr>
</tbody>
</table>

*Source: Simmons et al. 2002*

---

There are several types and methods of scaling up health operations: (a) expansion, including growth, restructuring or decentralization, franchising, or spin-off; (b) replication by policy adoption, grafting, diffusion, or mass media campaigning; or (c) collaboration, as through formal partnerships, strategic alliances, or coalitions (Cooley and Kohl 2005). As health is a state-governed matter in India, the scale-up model will be inherently contextual in approach, and there will be specificity by district, state, and region within the general policies laid out by NRHM and other national health and nutrition interventions.

Assam state, as an example, has agreed to convene a Model Districts policy and financing meeting three times a year. Participants will include the Health Minister, NRHM director and team, Model Districts Nodal Officer, Social Welfare Minister, Finance Minister, Model Districts team members, district and block officials, and other necessary state ministries.
covered by various levels of the government. The Model Districts project aims to present actionable recommendations from each district and advocate for policy changes at the state and national levels.

**FIGURE 3. Activities involved in establishing preconditions for and implementing, a scale-up process within the Model Districts project.**

**Operations research to demonstrate impact**

The Model Districts scale-up efforts are largely dependent on demonstrating feasibility and results throughout the impact framework (Figure 4) during block pilots and district-level operations. This will require rigorous operations research and monitoring and evaluation as the crux of the project.

First, a rigorous baseline will be conducted to assess system capacity and causes of poor health indicators, and provide valuable (and often unavailable) information for use in district case studies, shape files, and project plans. The integrated evaluation will include both primary surveys and secondary data analysis: (a) facility inventories, (b) cross-sectional household surveys with households about healthcare access and barriers to uptake, (c) cross-sectional provider surveys, (d) survey of community-based delivery, (e) epidemiological assessment of local disease burden, as possible, (f) infrastructure mapping, and (g) systematic operations research of management structures and delivery processes. A midterm evaluation and a final assessment will mirror the baseline. This situational assessment will establish the service demand, determine the applicability of the model throughout the NRHM structure, and provide the evidence base for the MD critical intervention mix.

Second, an ongoing monitoring and evaluation plan, using real-time metrics to measure, monitor, evaluate, and regularly report on results to service providers, government officials, policymakers, and community members, will be critical for gathering data on project operations in a time-sensitive manner to assess progress and impact as well as refine strategies. Qualitative operations research conducted annually will evaluate issues in active management, communications, planning and design, operational experiences, and best practices. Process documentation will contribute to our
overall contribution to the public health literature body. Impact assessments will be designed specific to particular innovations and interventions piloted at block level. These assessments will result in the refinement of programs for optimum benefit, analysis of program outputs and impacts, creation of research reports based on program results and findings, development policy briefs to be carried through to state and national levels for advocacy for change. Costing analyses will be conducted in order to introduce mechanisms to streamline existing funds for more efficient use, and determine how much additional, targeted funding is required for further innovations and scale-up.

Key stakeholders for operating at scale

As a model in systems strengthening and NRHM scale-up, the Indian government is the critical responsible party in the Model Districts project. Strong political will can assist in smooth operations and will enhance project efforts; however, a lack of political will in some areas is inevitable. The government, the Model Districts project team, and external partners will work as a cohesive team to achieve the goals of this initiative.

- District collectors’ offices are responsible for the implementation, management, and oversight of all intervention piloting at the block level and district-wide scale-up. District and block-level teams will have key inputs into the intervention planning process, to ensure that the process of mapping out policy-practice gaps involves a coordinated, cooperative effort with a nuanced understanding of the ground realities. District collectors will also be responsible for overall monitoring of operations as well as and for allocating additional funds already available in the district within their jurisdiction.

- State governments are responsible for allocating additional, targeted funds and replicating or adapting policies as required for the district. As these requirements are identified through proposals developed by district NRHM teams, these additional funds will be considered by state-level NRHM and government counterparts.

- The Ministry of Health & Family Welfare is responsible for allocating additional, targeted state funds, and considering evidence-based policy recommendations. They can also play a key role in the cross-dissemination of best practices and protocols to each of the Model Districts states as well as other states.

- The Model Districts team is responsible for developing the overall project strategy, technical assistance and intervention planning, operations research, robust monitoring and evaluation, and advocacy for the resources and policy support required during piloting and at-scale implementation.

Due to the project’s ultimate aims for scale-up by policy adaptation and replication, all piloting at block and district must be mindful of cost-effectiveness, and organizational and NRHM congruence. Partnerships will be very intentional and mindful of scalability; larger national partnerships will focus on support for the Columbia research team.
Intersectoral coordination

In order to truly create Models, a 360 degree approach of not only strengthening the health system, but all other systems as well, is imperative. A functioning health system at the district level is entirely dependent on the coordination between all sectors, including health, education, nutrition, water, electricity, infrastructure, and others engaged in rural development. Health systems strengthening is only possible when the overall goal of each key sector is aligned towards health outcomes. In this area, signs of success have already been achieved in our first district, Morigaon, Assam. In a district where no communication existed between the health, education, social welfare, and public health engineering departments, the District Collector in Morigaon now convenes a weekly group meeting with each of these departments for the purpose of uniting efforts towards improving health outcomes in the district. Enhancing cooperation and communication among district administration will be a cornerstone of the Model Districts strategy.

More specifically, the national nutrition program (Integrated Child Development Scheme - ICDS) and health program (NRHM) are currently operating as strict vertical processes with little to no horizontal communication. The ministries and departments out of which the programs are run are entirely separate from the national level all the way to the block and village levels, and thus the harmonious relationship that could benefit both does not exist.

EXPECTED OUTCOMES

Model Districts will develop a roadmap for the NRHM, particularly to demonstrate how systems improvements and corrected interventions can accelerate the country’s progress towards Millennium Development Goals 1, 4, and 5 by narrowing the policy-practice gap in NRHM service delivery and access. As such, Model Districts will focus on process-oriented outcomes (Figure 4) that will ensure efficient, effective, equitable, and transparent health planning, financing, and management for the continuum of maternal and child health care.

Service delivery outcomes include the following:

1. **New, intersectoral models of health governance, with particular convergence between health and nutrition programming.** These will include: (a) district leadership teams comprised of relevant departments (e.g. health, education, ICDS, public health engineering), (b) forums for inter-district learning exchange, and (c) state-level nutrition councils, chaired by the Chief Minister, to converge nutrition strategy and goals between key ministries, including Finance, Social Welfare, Health, Education, Food and Civil Supplies, Public Health Engineering, Rural Development, and Panchayats.

2. **Comprehensive, high-quality antenatal care available at village and household level for women in rural areas,** through: (a) targeted follow-up using mother-child tracking systems, (b) availability of job aids and mobile phone-based learning tools for health workers, (c) improved training for frontline health workers, (d) targeted demand-side financing and use of untied funds, (e) improved planning for Village Health and Nutrition Days, and (f) technological solutions for real-time reporting on stocks and equipment requirements.

3. **Increased access to a means of safe delivery** by improved birth planning, referral services, timely incentives and support for delivery accompaniment by ASHA, and wider coverage of skilled attendance services, including emergency obstetric care.

4. **Strengthened postnatal care for mothers and children** through (a) facility quality improvements to encourage 24-48 hours stay, and availability of newborn care units, (b) targeted follow-up
visits using mother-baby tracking, (c) incentivizing ASHA newborn visits in the home, and (d) training for frontline health workers in IMNCI, newborn resuscitation, and newborn sepsis.

(5) **Ensure targeted nutrition programming and early childhood development for children under three**, including (a) growth monitoring schemes for all children under 5 that includes home-based breastfeeding and feeding counselling, malnutrition screening, and follow-up, and is recorded in mother-child tracking, (b) management protocols for cases of acute malnutrition, (c) conditional cash transfers, and (d) improved distribution and management of supplementary feeding supplies.

(6) **Improved availability of treatment for childhood illness**, especially diarrhoea and acute respiratory infections, by (a) improved training on IMNCI and drug kit use for frontline health workers, (b) utilizing technological solutions for regular reporting on stocks to avoid stock-out.

(7) **Increased coverage of childhood immunizations, particularly full immunizations for children under 9 months of age**, particularly through (a) strengthened follow-up through mother-baby tracking systems, (b) adequately incentivizing participation in VHND by ANM, ASHA, and AWW, (c) ensuring adequate financial and logistical support to ensure that immunization supplies and cold chain reach VHND.

**CONCLUSION**

Through targeted interventions and additional public health spending aimed at the intersection of the six building blocks of health systems strengthening and the five areas along the continuum of care for mothers and children, the Model Districts project aims to demonstrate what health and nutrition interventions are needed to narrow policy-practice gaps within NRHM. The program intends to operate at scale, supported by a robust baseline and monitoring and evaluation plan, by piloting interventions at the block level, expanding growth to the district based on learning exchanges within and across districts, and finally scaling up to the national level through policy adaptation and replication upon the presentation of evidence-based recommendations to the Ministry of Health and Family Welfare through the International Advisory Panel. This paper commences the Model Districts contribution to the growing literature body on the requirements for health systems strengthening in India within the context of the National Rural Health Mission.
REFERENCES


World Bank 2009, World Development Indicators.

ANNEX

ANNEX 1
Map of Model Districts in India

ANNEX 2
Key performance indicators in the Model Districts, 2007-2008

ANTENATAL CARE and SAFE DELIVERY

Rate of antenatal care uptake and safe delivery in all five Model Districts
DLHS-III 2007-2008
**POSTNATAL CARE**

**Rate of postnatal care access in all five Model District States**

**DLHS-III 2007-2008**

<table>
<thead>
<tr>
<th>State</th>
<th>Percentage of women receiving postnatal care within 2 weeks of delivery</th>
<th>Percentage of children under 3 who received a check up within 24 hours of birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>41.7</td>
<td>38.2</td>
</tr>
<tr>
<td>Bihar</td>
<td>38.2</td>
<td>29.8</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>33.8</td>
<td>25.8</td>
</tr>
<tr>
<td>AP</td>
<td>40.5</td>
<td>38.8</td>
</tr>
<tr>
<td>UP</td>
<td>79.4</td>
<td>32.6</td>
</tr>
<tr>
<td>Assam</td>
<td>75.3</td>
<td>30.4</td>
</tr>
</tbody>
</table>

**Infant feeding in all five Model Districts**

**DLHS-III 2007-2008**

<table>
<thead>
<tr>
<th>District</th>
<th>Percentage of children under 3 who received colostrum</th>
<th>Percentage of children under 3 who were breastfed within the first hour of birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jehanabad</td>
<td>74.2</td>
<td>44.3</td>
</tr>
<tr>
<td>Dausa</td>
<td>92.0</td>
<td>21.4</td>
</tr>
<tr>
<td>Medak</td>
<td>94.1</td>
<td>24.5</td>
</tr>
<tr>
<td>Unnao</td>
<td>95.1</td>
<td>46.1</td>
</tr>
<tr>
<td>Morigaon</td>
<td>67.9</td>
<td>15.3</td>
</tr>
</tbody>
</table>

**IMMUNIZATIONS**

**Rate of childhood immunization in all five Model Districts**

**DLHS-III 2007-2008**

<table>
<thead>
<tr>
<th>District</th>
<th>Percentage of children (12-23 months) who are fully immunized</th>
<th>Percentage of children (12-23 months) who received measles vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medak</td>
<td>82.8</td>
<td>55.6</td>
</tr>
<tr>
<td>Jehanabad</td>
<td>44.7</td>
<td>24.5</td>
</tr>
<tr>
<td>Dausa</td>
<td>38.5</td>
<td>62.8</td>
</tr>
<tr>
<td>Unnao</td>
<td>36.1</td>
<td>50.0</td>
</tr>
<tr>
<td>Morigaon</td>
<td>55.6</td>
<td>65.9</td>
</tr>
</tbody>
</table>
### CHILDHOOD MALNUTRITION

#### Nutritional status in all five Model District States

<table>
<thead>
<tr>
<th>State</th>
<th>Percentage of children (6-35 months) who were exclusively breastfed for 6 months</th>
<th>Percentage of children under 3 who are not underweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>26.2</td>
<td>59.6</td>
</tr>
<tr>
<td>Bihar</td>
<td>32.3</td>
<td>63.0</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>11.8</td>
<td>58.0</td>
</tr>
<tr>
<td>AP</td>
<td>31.6</td>
<td>44.0</td>
</tr>
<tr>
<td>UP</td>
<td>25.4</td>
<td>66.7</td>
</tr>
<tr>
<td>Assam</td>
<td>8.2</td>
<td>64.2</td>
</tr>
</tbody>
</table>

### CHILDHOOD ILLNESS MANAGEMENT

#### Proportion of children suffering from diarrhoea in past two weeks, and who sought treatment (2007-2008 DLHS-III)

<table>
<thead>
<tr>
<th>State</th>
<th>Total % of children who suffered from diarrhoea in the previous two weeks</th>
<th>Proportion of children suffering from diarrhoea that sought treatment</th>
<th>Proportion of children suffering from diarrhoea that did not seek treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medak</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Jehanabad</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Dausa</td>
<td>12</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Unnao</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Morigaon</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Proportion of children suffering from acute respiratory infections in past two weeks, and who sought treatment (2007-2008 DLHS-III)

<table>
<thead>
<tr>
<th>State</th>
<th>Total % of children who suffered from ARI in the previous two weeks</th>
<th>Proportion of children suffering from ARI that sought treatment</th>
<th>Proportion of children suffering from ARI that did not seek treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medak</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Jehanabad</td>
<td>20</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Dausa</td>
<td>15</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Unnao</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Morigaon</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>
**ANNEX 3**

Critical intervention mix within the scope of the Model Districts project

### UNIVERSAL COVERAGE

**ANTENATAL CARE**
- Preventative measures
  - Tetanus toxoid immunization (2 shots)
  - Iron and folic acid

**Detection and management**
- Pregnancy-induced hypertension (PIH)
- Severe anaemia
- Syphilis
- Eclampsia
- Multiple pregnancies or other complications

**Counselling & preparedness**
- Birth and emergency plans
- Breastfeeding promotion

**DELIVERY**
- Clean delivery practices
- Skilled obstetric care
- Newborn resuscitation
- Comprehensive emergency obstetric care (see Table 4)

**POSTNATAL CARE**
- Essential care package
- Hygienic cord and skin care
- Hypothermia prevention and management
- Breastfeeding promotion (immediate initiation, exclusive)
- Care of low birth weight (LBW) infants (extra attention to warmth, hygiene, feeding)
- Emergency management for sepsis and extreme LBW
- Community case management for pneumonia

**WELL CHILD CARE**
- Exclusive, on-demand breastfeeding for at least 6 months
- Improved complementary foods for children 6 months to 2 years
- Growth monitoring and counselling on feeding problems and recommendations per age group
- Vitamin A supplementation – 6 to 59 months
- Regular deworming
- Full immunizations by 9 months
- Household hygiene and sanitation, safe water source, waste disposal
- Early childhood development
- Injury prevention

**SICK CHILD CARE**
- Integrated management of diarrhoea, pneumonia, fever, infections, ear problems, and anaemia
- Treating severe acute malnutrition (SAM) with ready-to-use therapeutic foods, and managing moderate (MAM) with improved, fortified foods* (not yet in Indian guidelines)

### ADDITIONAL

- Peri-conceptual folic acid supplementation
- Detection and treatment of asymptomatic bacteriemia
- Antibiotics for preterm premature rupture of membranes
- Antenatal corticosteroids for preterm delivery

---

**ANNEX 4**

Functions of basic and comprehensive emergency obstetric care services

<table>
<thead>
<tr>
<th>BASIC SERVICES</th>
<th>COMPREHENSIVE SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer parenteral antibiotics</td>
<td>All services included in basic emergency obstetric care plus:</td>
</tr>
<tr>
<td>Administer parenteral oxytocic drugs</td>
<td>Perform surgery (cesarean section)</td>
</tr>
<tr>
<td>Administer parenteral anticonvulsants for pre-eclampsia and eclampsia</td>
<td>Perform blood transfusion</td>
</tr>
<tr>
<td>Perform manual removal of retained products</td>
<td></td>
</tr>
<tr>
<td>Perform assisted vaginal delivery</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** Emergency Obstetric Care, Checklist for Planners, UNFPA 2002.