

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

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ABSTRACT

While India has experienced some improvements in health indicators in recent years in terms of Millennium Development Goals 1, 4, and 5, the country still has some of the lowest indicators for 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, Columbia University, and the Ministry of Health and Family Welfare, Government of India. Its goal is to demonstrate which health and nutrition interventions are required to narrow policy-practice gaps in the 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 (infrastructure, data management, governance, financing, supply chain management, and frontline health worker capacity) 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, pilot interventions at the block level, growth and expansion to the district level 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 research on the health system strengthening requirements for rural India, and is intended for use in policy-making and health-programming.

INTRODUCTION

India's aspiration 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, and aims to improve the rural populations' access to quality health care, particularly for the poor, women, and children. At the request of the MOHFW, the Earth Institute, Columbia University, has been convening an International Advisory Panel (IAP)¹ that meets biannually to review NRHM progress and advise the NRHM on international best practices relevant to rural India. The Earth Institute conducted a mid-term evaluation of the NRHM, which demonstrated that coverage of high-priority interventions remains inadequate, the quality of programming is insufficient, efficient management and governance is lagging, and deep-rooted inequities further complicate delivery and uptake (Paul *et al.* 2011, Bajpai *et al.* 2009). Corrective action is required immediately to accelerate progress towards national targets and the 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 socio-cultural, political, and economic contexts. The MOHFW and the Earth Institute selected one state from each geographical region: Assam (Northeast), Bihar (East), Uttar Pradesh (North), Rajasthan (West), and Andhra Pradesh (South), and further selected² an individual district within each state for the pilot program.³

These five Model Districts will serve as regional pilots for scaling up innovations and quality improvements in the six health system building blocks: infrastructure, data management, governance, financing, supply chain management, and frontline health worker capacity. 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 routine and sick child care. With this strategy, the Model Districts will seek to create 'centres of excellence' which address existing challenges 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 initiative⁴, the project's proposed strategy for narrowing the policy-practice gaps and scaling-up best practices and innovations, and the expected outcomes and impacts of the project. This working paper, and continued work during the course of the project, seeks to contribute to discussions of what is required to strengthen health systems for India's rural citizens, and should inform policy makers, programme managers, and health researchers.

¹ The International Advisory Panel (IAP) was initiated in 2006 and at the Ministry of Health and Family Welfare's request, the group has since been meeting twice yearly.

² District selection criteria included: rural (urbanization <20%), accessibility from the capital city, and poor primary health indicators.

³ 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.

⁴ The Model Districts research team is generously supported by the IKEA Foundation, particularly with the help of Per Heggenes, Marianne Barner, and Vandana Varma.

BACKGROUND

India has experienced strong economic growth in the past two decades, and has made some progress towards poverty reduction, improving education, and achieving the Millennium Development Goals. However, healthcare goals have lagged significantly, and unacceptably high rates of maternal mortality, infant mortality, and under-nutrition persist (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 1. India's progress towards Millennium Development Goals 1, 4, and 5 Targets

| MILLENNIUM DEVELOPMENT GOAL TARGET | BASELINE | CURRENT | BY 2015 |
|---|-------------------------|--|---------|
| Reduce the proportion of children moderately or severely underweight by half ⁵ | 53% (1993)* | 43% (2006) ⁺ | <27% |
| Reduce under-5 mortality rate per 1,000 children by 2/3 | 118 (1990) [#] | 69 (2008) [%] 63 (2010) [!] | <38 |
| Reduce infant mortality rate per 1,000 live births by 2/3 ⁶⁷ | 83 (1990) ^{##} | 52 (2008) [%] 50 (2009) ⁺ | <30 |
| Increase proportion of children under 12 months immunized against measles to 75% | 56% (1990)* | 70% (2008) [%] | 75% |
| Reduce maternal mortality rate per 100,000 live births by ¾ ⁸ | 570 (1990)* | 450 (2006) ^{>} | <100 |
| Increase proportion of (rural) births attended by skilled health personnel | - | 43.6% (2008) [^] | >80% |

SOURCES:[#]World Bank World Development Indicators, [%]UNICEF, [^]DLHS-III (rural), [!]Institute of Health Metrics & Evaluation, ⁺SRS January 2011 Bulletin, [>]SRS Bulletin2004-06, ⁺NFHS-III, ^{*}MDG Monitor

Child health indicators in India are particularly dismal, with one in 15 children dying before their fifth birthday. The World Bank estimates that this accounts for the loss of 1.8 million children a year (World Bank 2009). Eight states are responsible for 75% of infant mortality; the five Model Districts are within these states (UNICEF 2008). A third to one half of all childhood deaths in India are related to malnutrition; about 30% of children are born with a low birth weight, 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 the age of five are underweight and 48% are stunted by chronic malnutrition, making India 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 through existing health programs. Nearly 30% of childhood deaths attributed to stunting, severe wasting, and low birthweight worldwide occur in India — responsible for 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

⁵ The National Plan of Action for Children (2005) set a goal of reducing moderately or severely underweight children by half by 2010.

⁶ National infant mortality targets: the National Population Policy (2000) and NRHM set a goal of <30 per 1,000 livebirths by 2010; while the National XI Plan sets a goal of 28 per 1,000 livebirths by 2012. It appears that none of these goals will be reached in rural India, even by 2015.

⁷ National neonatal mortality targets: the National Plan of Action for Children (2005) set a goal of <18 neonatal deaths per 1,000 livebirths by 2010; the current status is 35 deaths per 1,000 livebirths (2008).

⁸ National MMR targets: the National Population Policy (2000) and NRHM's goal is <100 per 100,000 livebirths by 2010.

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, or 68,000 individuals per year. Comparatively, China's MMR is less than a fifth than that of India, or 45 per 100,000 (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 states⁹¹⁰, four of which have Model Districts (UNICEF 2009). The majority of these deaths could be prevented through safe¹¹ deliveries and adequate maternal care. However, only 52.7% of women have a safe delivery. Less than 20% receive 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 a 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 is required to provide adequate quantity and improve the quality of primary healthcare in these states. In [YEAR] The Earth Institute, 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 the time, public health spending was below 0.9% of 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 resources to create a public health system for rural India, and particularly one that reached the most vulnerable pockets of population, including the poor, women, children, and marginalized groups.

The National Rural Health Mission

The Prime Minister of India launched the NRHM on 12 April 2005, in an effort to improve public health service delivery, particularly in 18 high-focus states¹² that suffered from weak infrastructure and poor health indicators. The NRHM 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. The 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 NRHM's services target established critical care interventions in defined high-focus districts, in order to create access to equitable, affordable, accountable, and effective primary health care. The 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 is to provide effective health services to the rural masses by:

⁹ There are 28 states and 7 Union territories in India as of 2011.

¹⁰ These states include Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Orissa, Madhya Pradesh, Chhattisgarh, Rajasthan, and Assam.

¹¹ A safe delivery is defined as one in an institution or at home attended by skilled health professional.

¹² 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.

- (a) ensuring that the central government raises public health spending from 0.9% GDP to 2-3% of GDP¹³, and creating new financing mechanisms, including facility-based funding for spending flexibility;
- (b) 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);
- (c) strengthening facility infrastructure and capacity to increase and meet local demand;
- (d) ensuring household- and village-level health services access by deploying a community Accredited Social Health Activist (ASHA) and strengthen sub-centres;
- (e) driving the convergence of hygiene, sanitation, nutrition, local health traditions¹⁴, 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 the NRHM conducted by The Earth Institute, Columbia University (Bajpai, Sachs, and Dholakia 2009). The evaluation recognized that the NRHM had achieved commendable progress in a number of areas, including the deployment of one ASHA for every 1000 people; the 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 be addressed if the NRHM was to succeed at scale:¹⁵

1. The system required much higher public health spending, and higher outlays in particular for the NRHM.
2. ASHAs required proper recruitment, comprehensive training (e.g. full induction, on-the-job, and regular refresher courses), effective oversight, and payments that are timely and adequate.¹⁶

¹³ Prior to launching the 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.

¹⁴ This includes Ayurveda, Yoga, Unani, Sidha and Homeopathic (AYUSH) treatments.

¹⁵ A number of these issues reiterated preliminary research on requirements for the NRHM (e.g. Satpathy and Venkatesh 2006). A 2011 Lancet series on universal primary healthcare in India echoed the NRHM mid-term evaluation by repeatedly calling 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 Lancet series noted inadequacies in planning, financing, human resources, infrastructure, supply chains, information use, governance, and monitoring, and called for a transformation of the health system by further decentralizing management to the 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).

¹⁶ 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 ASHAs, 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-financial) to motivate the ASHA workforce.

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 the 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. The NRHM must focus on scaling up high-impact, critical care interventions to target the persistently high infant mortality rate (IMR), especially neonatal¹⁷ mortality, and the maternal mortality rate (MMR).
7. The NRHM must be better integrated with nutrition programming, working especially closely with the Anganwadi workers of the Integrated Child Development Services (ICDS).¹⁸

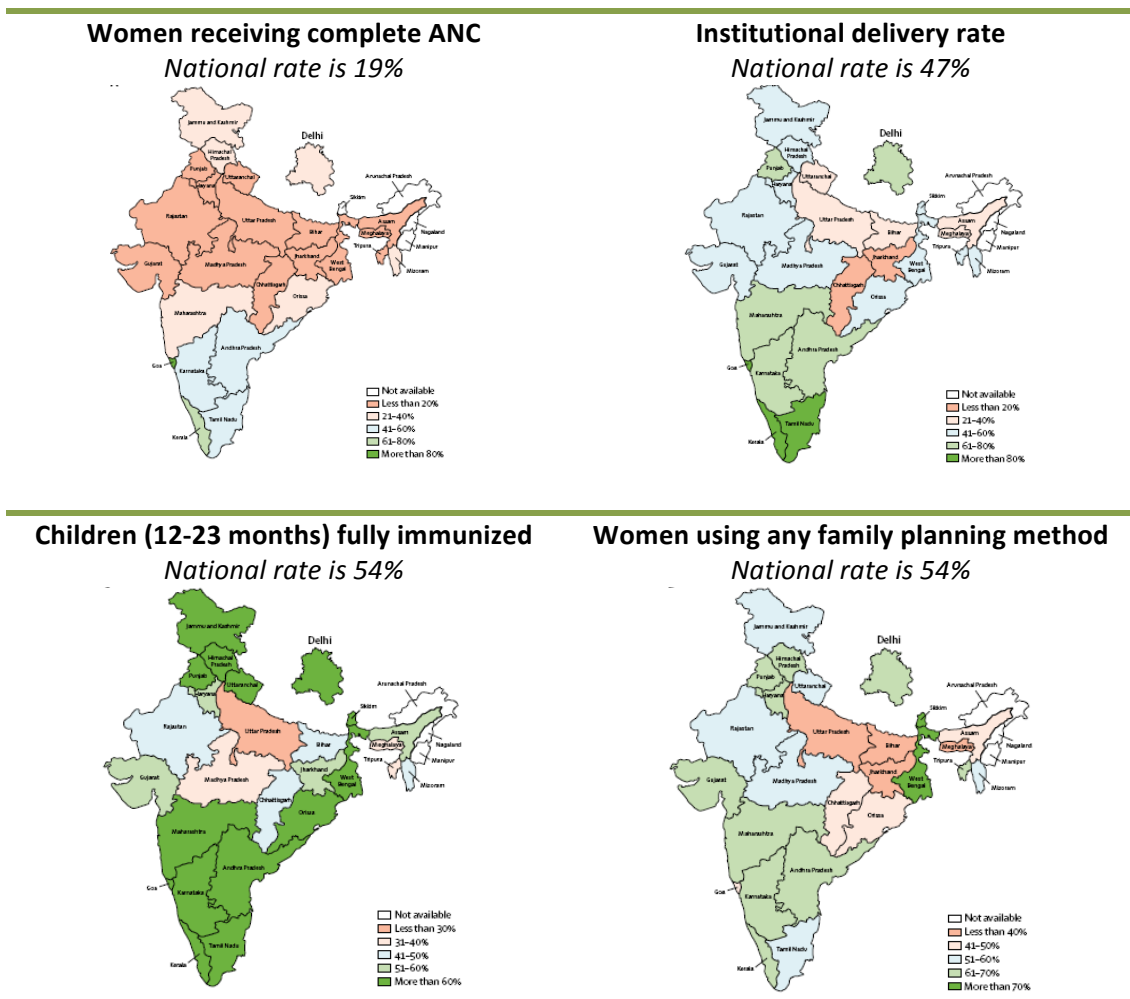
The case for regional models of scale-up

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).

¹⁷ Neonatal mortality is a death occurring in 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).

¹⁸ Convergence between health and nutrition sectors has long been a concern for governance and effective programming in India, and the 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).

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



SOURCE: Paul et al. 2011, data source DLHS-III (2007-2008)

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 Panel¹⁹, the concept of Model Districts was proposed as a model for the scale-up of best practices that target region-specific factors in 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 — infrastructure, data management, governance, financing, supply chain management and frontline health worker capacity — have the linkages and capacity to provide quality health services and meet health system goals.²⁰

¹⁹ 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.

²⁰ 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).

As an advisory project, the Model Districts project seeks 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.

THE MODEL DISTRICTS PROJECT APPROACH

The Model Districts project (MD) was launched as a joint initiative between the Earth Institute and the MOHFW, and aims to demonstrate the health and nutrition interventions needed to narrow policy-practice gaps in the 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 improvements. Project findings will be documented as best-practices 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-ups 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).²¹ Districts were deliberately chosen as the model unit for operations because districts represent the most aggregate sub-state units of governance in India, and are responsible for planning, budgeting, and management across all sectors (e.g. health, education, water, sanitation, electricity, nutrition, etc.). Villages are too small and too numerous to make representative models due to the large scale of India's population.

These districts were selected to represent five major regions and their varied issues in service delivery, as each requires distinct solutions, but there will also be a considerable amount of overlap in learnings from each of the districts. Operating in five districts simultaneously will steepen the 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 the best practices and innovations of one district to another, thus speeding progress. There will be a number of forums for sharing lessons and research results 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 represent the perspectives of five major regions in the country.

²¹ 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.

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 (Figure 2). The Model Districts project will follow a two-step process within the health system 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.

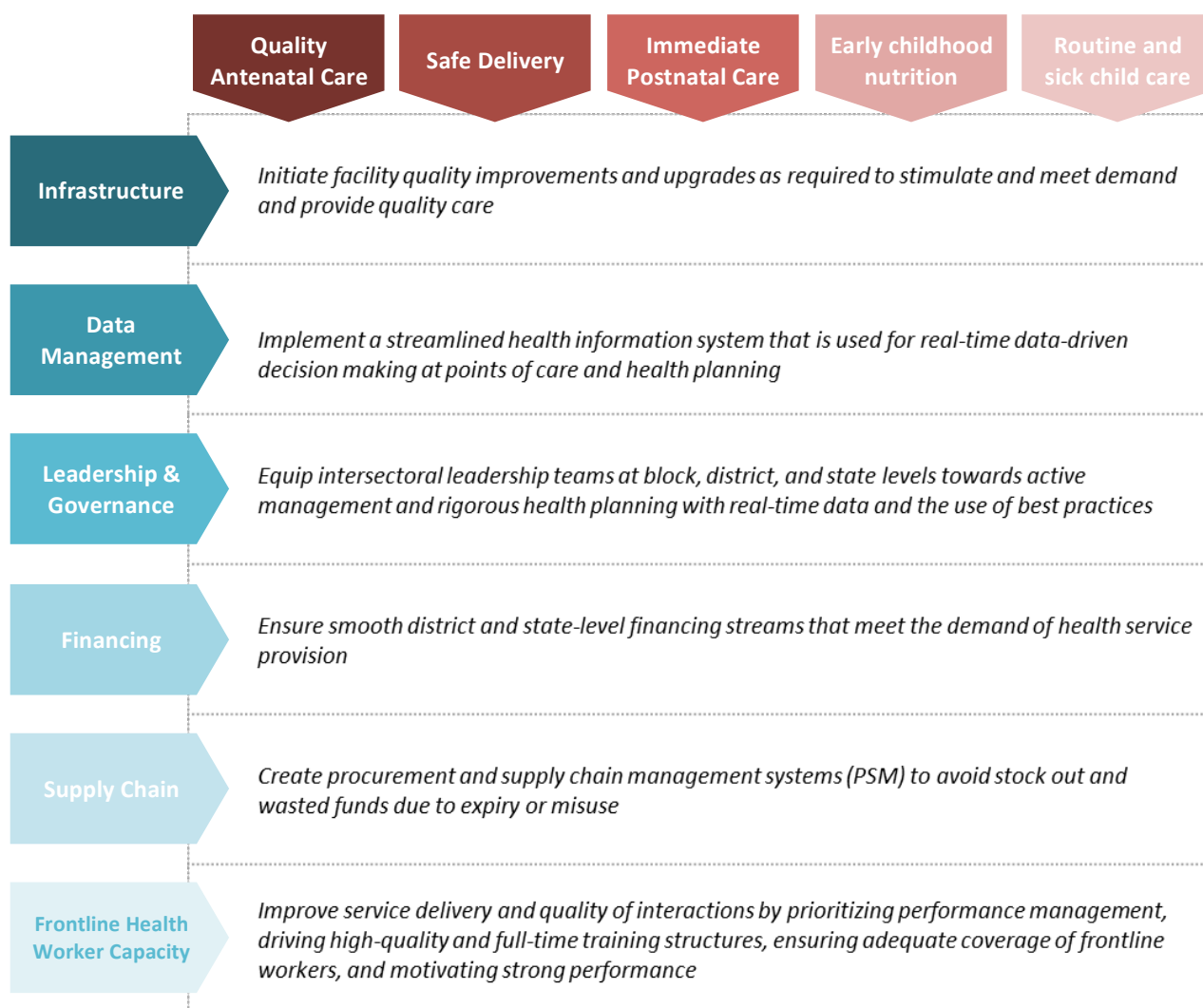
After these policy-practice gaps have been identified with the use of the developed strategic framework, the Model Districts team and district officials aim to strengthen system capacity and improve community level management to meet charted outcomes and targeted areas within each intersection of the strategic framework (e.g. the supply requirements for providing quality antenatal care, or the infrastructural requirements to providing safe delivery). Targeted interventions, informed by a robust needs assessment, 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.²²

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 system; as such, a streamlined, real-time data management system is required to enable data-driven decision making and health planning.

Third, inter-sectoral leadership teams at the block and district levels must have the political will and training 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 the creation of a procurement and supply chain management system is therefore 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 the others, and the system requires strengthening within each area to function efficiently, effectively, and transparently.

²² See Annex for targeted critical care interventions in maternal and child health.

FIGURE 2. Model Districts’ strategic framework for mapping policy-practice gaps and creating district-level targets.



Interventions within the Model Districts project will target the intersection of each of the above six building blocks of health systems and the five core areas along the continuum of maternal and child health. To improve health service delivery and thus health outcomes, the policy-practice gaps must be plugged within each of the 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 with sufficient capacity.²³ Innovations will be piloted at the

²³ 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. Second, breadth of coverage will be addressed by

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 scale-up at the district level. India-wide working groups comprised of technical leaders in the field will ensure that the most current standards and existing resources are being applied to Model Districts operations. Strategic partners will be engaged in funding, implementation, and technical support at the local level 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.

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

| |
|---|
| <ol style="list-style-type: none"> 1. Credible and evidence-based 2. Transparent/ explicit/open [seem better word choices here] to ensure those implementing, monitoring, and accessing can see results in practice 3. Positive cost-benefit over existing practices 4. Relevant to most persistent or severe problems 5. Compatible with existing NRHM structures 6. Easy to transfer and adopt at district level 7. Testable in pilot form at block/district, without requiring full adoption before results are established |
| <p>Source: Simmons et al. 2002</p> |

3. **Scale-up by policy adaptation and replication:**²⁴ The research team from the Earth Institute will present the evidence-based policy recommendations from the Model Districts program during regular meetings with state health officials,²⁵ 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

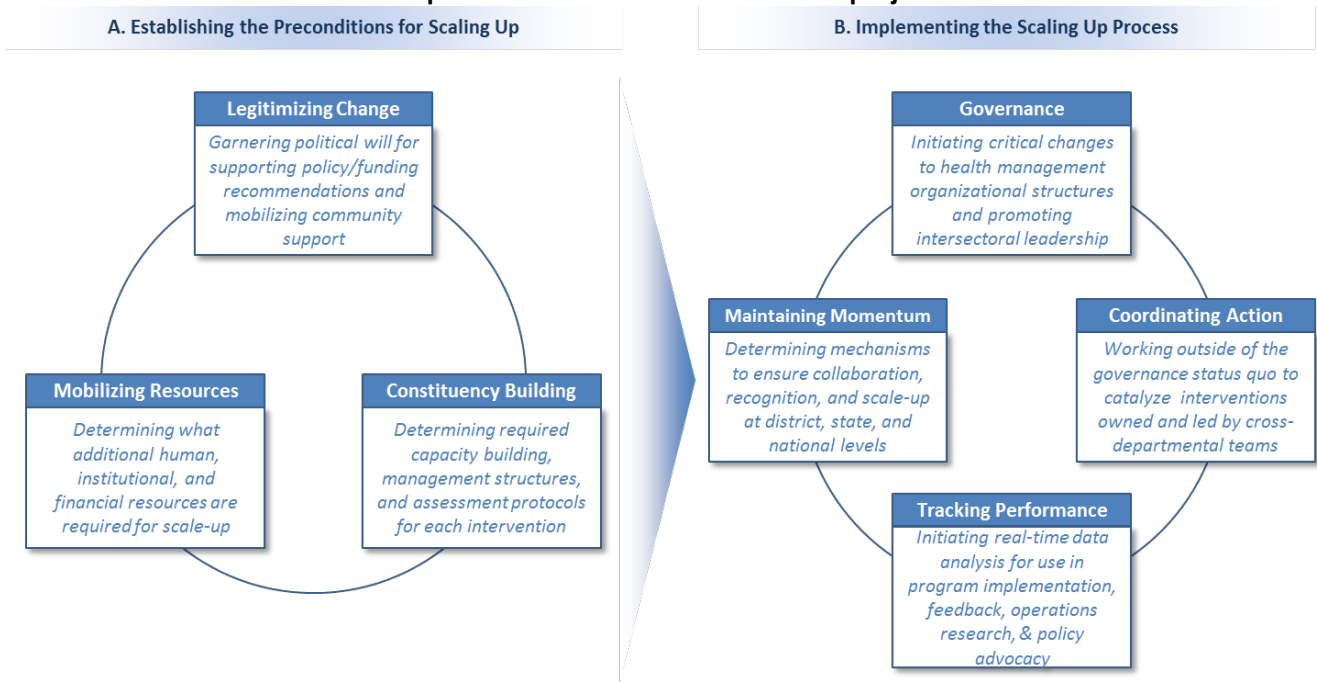
extending services to more women and children in currently serviced localities, particularly home-based actions and more functional and efficient community-based programming. Lastly, the project will address depth of services by aiming to provide additional services to current clients. This will be particularly targeted in service delivery improvement and performance management in health and nutrition programming (Cooley and Kohl 2005).

²⁴ 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 (Colley 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 the NRHM and other national health and nutrition interventions.

²⁵ 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.

Welfare, the MOHFW has committed additional public health spending to cover on-going costs of the interventions, making this a sustainable model.

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



SOURCE: Cooley and Kohl 2005; Brinkerhoff and Crosby 2002

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. Rigorous operations research and monitoring and evaluation are therefore central to the project.

A rigorous baseline assessment will be conducted to determine system capacity and the root causes of poor health indicators. It will also provide valuable (and often unavailable) information for use in district case studies, shape files for integration with GIS software, and project plans. The integrated evaluation will include both primary surveys and secondary data analysis: (a) facility inventories, (b) cross-sectional household surveys about healthcare access and barriers to uptake, (c) cross-sectional provider surveys, (d) survey of community-based delivery, (e) an epidemiological assessment of local disease burden, when possible, (f) infrastructure mapping, and (g) systematic operations research on management structures and delivery processes. A midterm evaluation and a final assessment will mirror the baseline and track progress. 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.

Figure 4. Impact Framework.

| |
|--|
| INPUTS are the resources (e.g. funding, staff, time, equipment) required to achieve results. |
| PROCESSES are the activities (e.g. training, supervision) of an intervention with these resources. |
| OUTPUTS are the direct results of interventions (e.g. numbers of staff trained, supervision visits, increased number of treatment sites). |
| OUTCOMES are the intervention’s direct positive effects, as a result of outputs, such as behaviour change (e.g. appropriate treatment, timely follow-up care, no stock-outs) that would ultimately have long-term effects on disease. |
| IMPACTS are long-term changes in a disease profile, such as a reduction in mortality, incidence of childhood illness, or improved quality of life. |

Second, an ongoing monitoring and evaluation plan – using real-time metrics to measure and report data to providers, government officials, policymakers, and community members – will be critical for assessing progress and refining strategies in a time-sensitive manner. Qualitative operations research will be conducted annually to evaluate issues in active management, communications, planning and design, operational experiences, and best practices. Process documentation will contribute to the public health literature body. Impact assessments will be tailored to particular interventions piloted at block level. These assessments will allow the refinement of programs for optimum benefit, analysis of program outputs and impacts, creation of research reports based on program results and findings, and the 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 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 District 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, 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 NRHM congruence. Partnerships will be very intentional and mindful of scalability; larger national partnerships will focus on support for the Earth Institute research team.

Intersectoral coordination

In order to create replicable 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 coordination between all sectors, including health, education, nutrition, water, electricity, infrastructure, and others engaged in rural development. Health system strengthening is more successful when the overall goal of each key sector is aligned towards health outcomes. In this area, signs of success have emerged in our first district, Morigaon, Assam. Previously no communication existed between the health, education, social welfare, and public health engineering departments, but now the District Collector in Morigaon convenes a weekly group meeting 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 collaborative relationship that could benefit both does not exist.

EXPECTED OUTCOMES

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 supply stocks and equipment requirements.
- (3) **Increased access to safe delivery** by improved birth planning, referral services, timely incentives, support for delivery accompaniment by an 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 Integrated Management of Newborn and Child Illness²⁶ IMNCI, newborn resuscitation, and newborn sepsis.

²⁶

Indian adaptation of the WHO and UNICEF Integrated Management of Childhood Illness strategy

- (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, feeding counselling, malnutrition screening, 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 Auxiliary nurse midwives, ASHA, and anganwadi workers, (c) ensuring adequate financial and logistical support to ensure immunization supplies and cold chain reach VHND.

CONCLUSION

Targeted interventions and additional public health spending at the intersection of the six building blocks of health system strengthening and the five areas along the continuum of care for mothers and children, will allow the Model Districts project 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 assessment, and a monitoring and evaluation plan. It will pilot interventions at the block level, expand to the district level 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 MOHFW 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.

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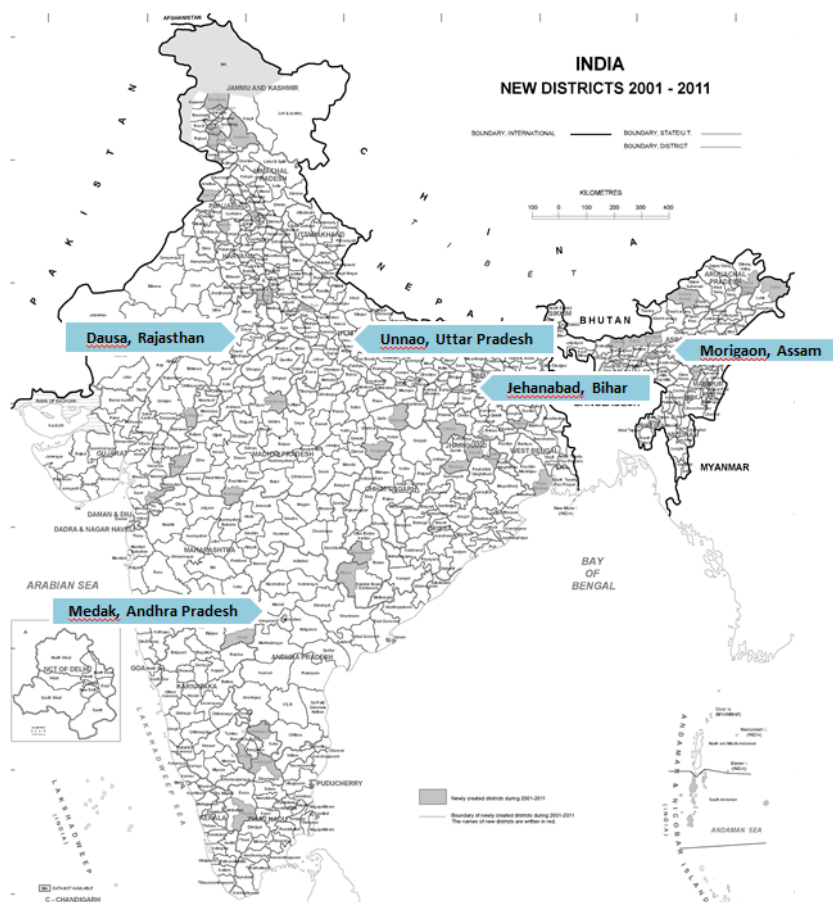
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ANNEX

ANNEX 1

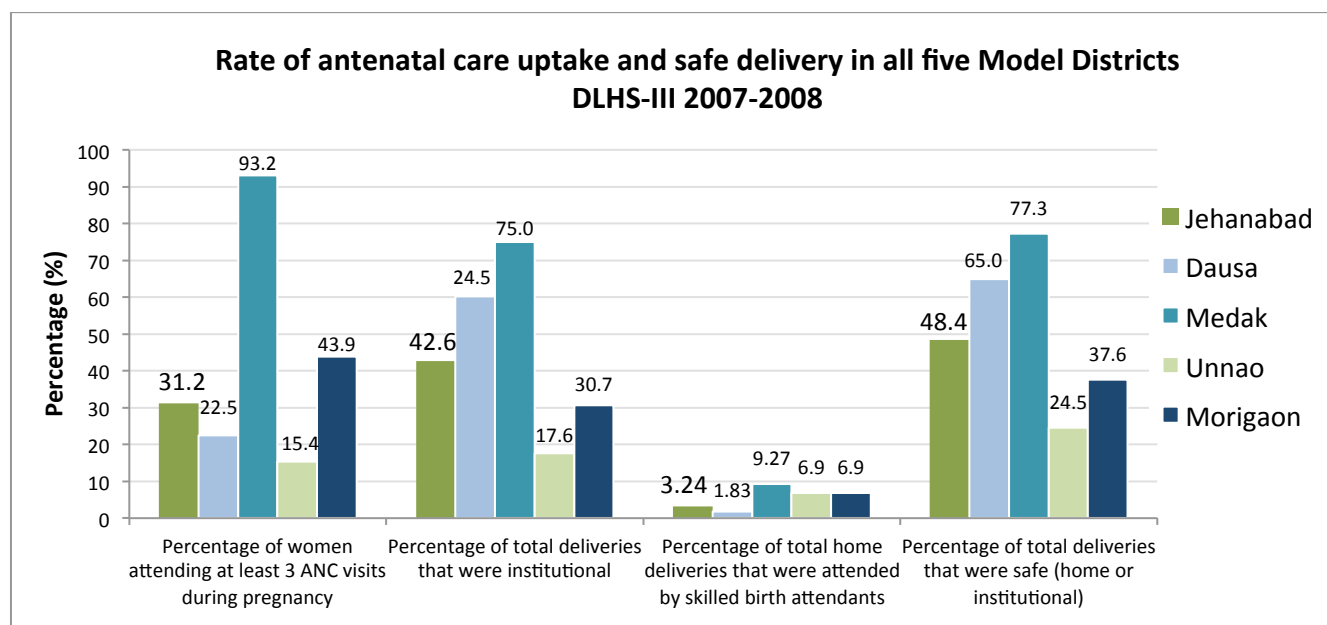
Map of Model Districts in India



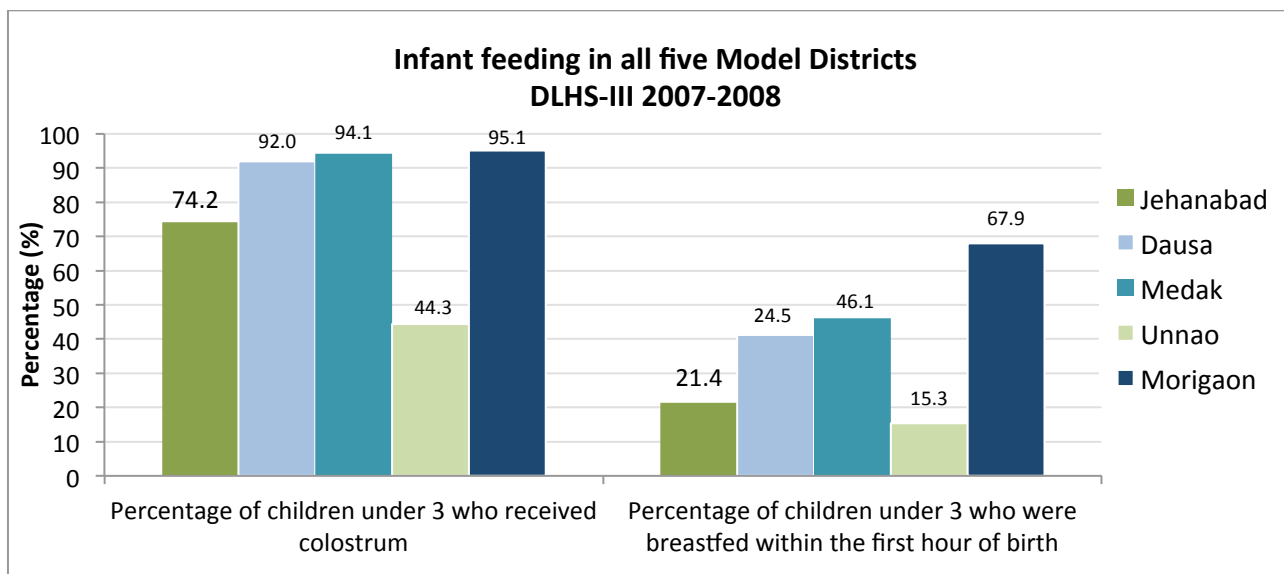
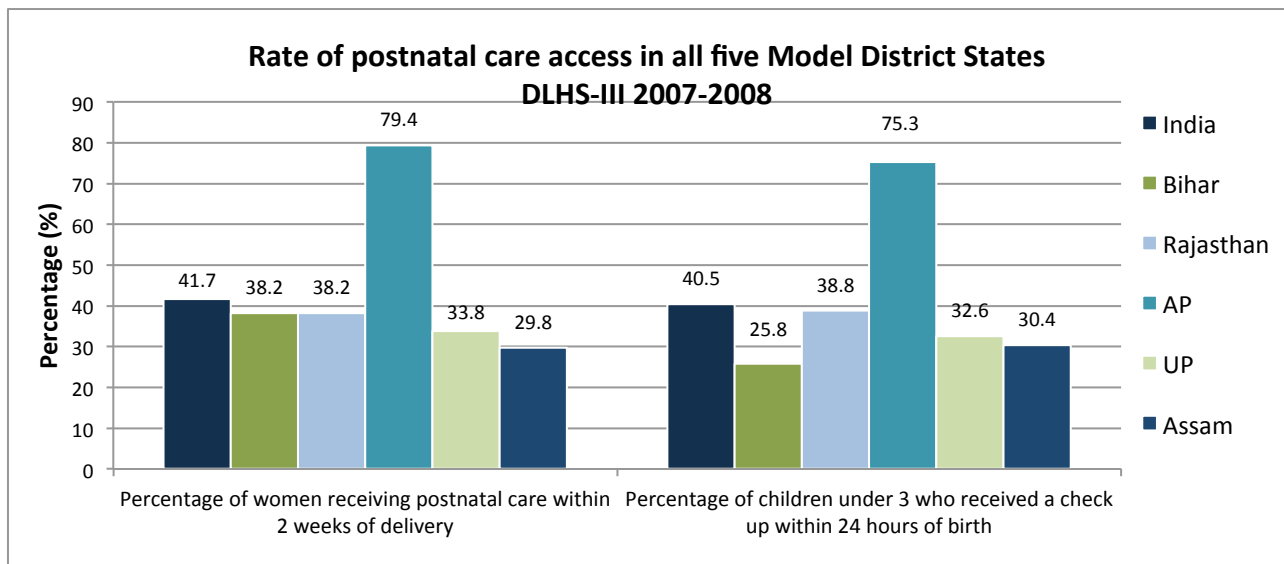
ANNEX 2

Key performance indicators in the Model Districts, 2007-2008

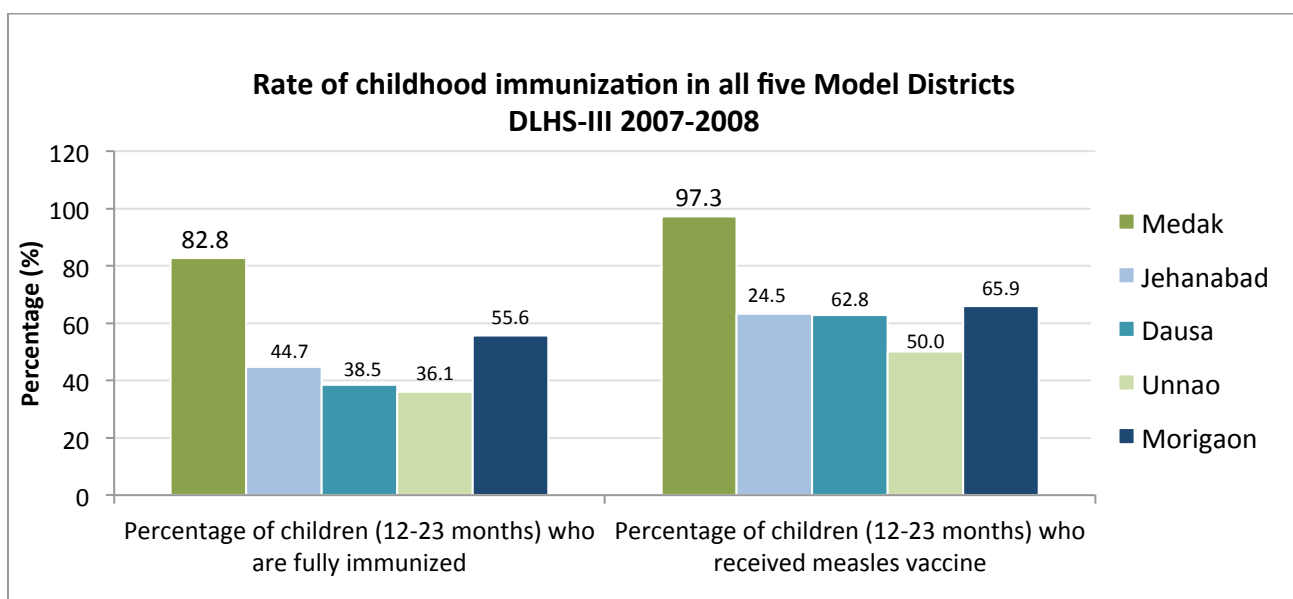
ANTENATAL CARE and SAFE DELIVERY



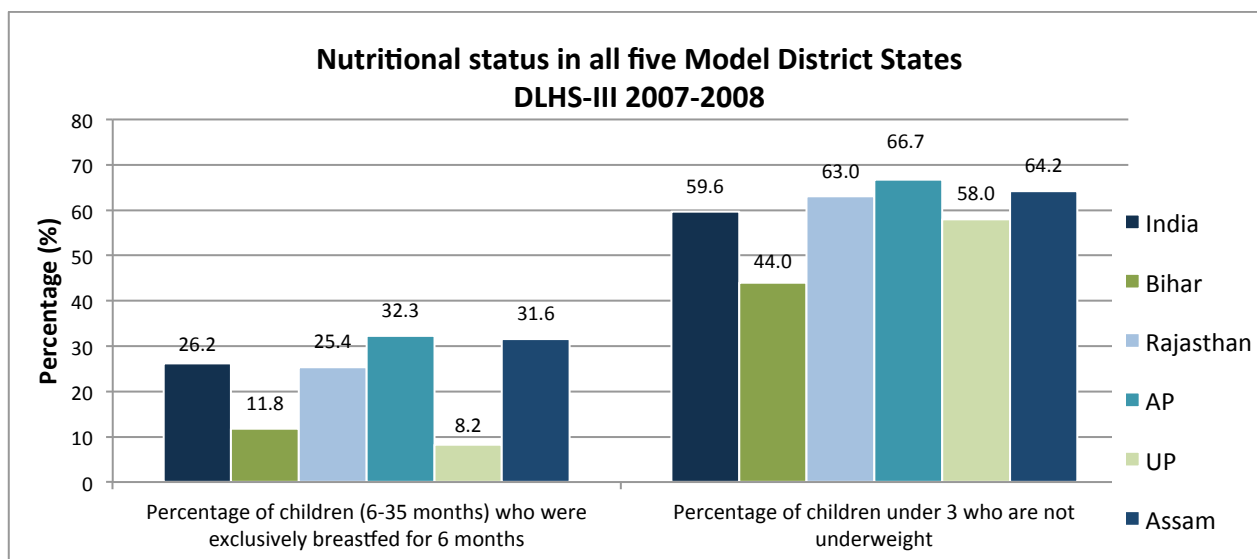
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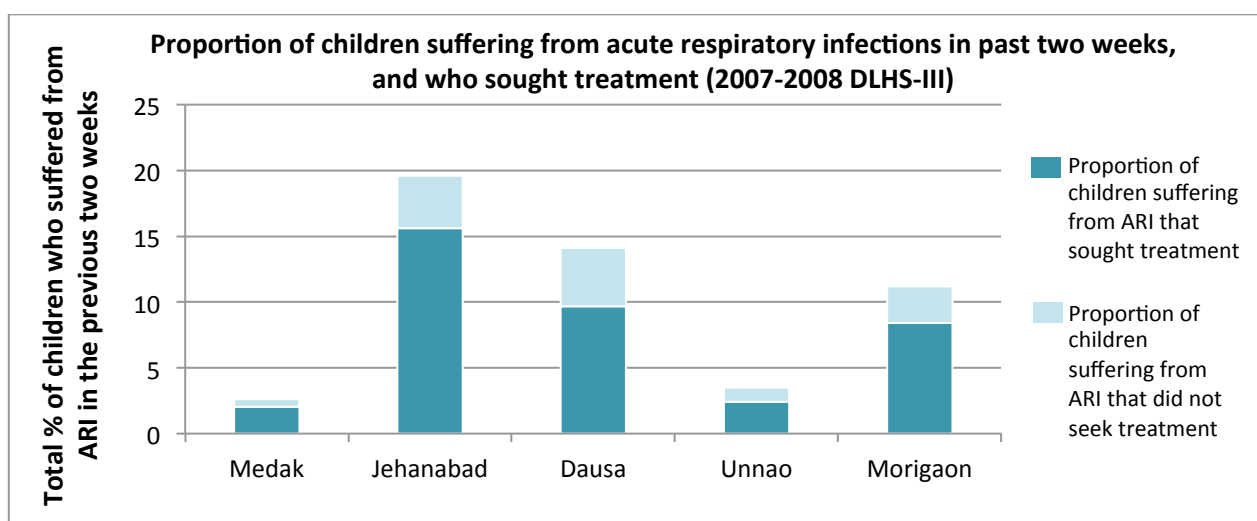
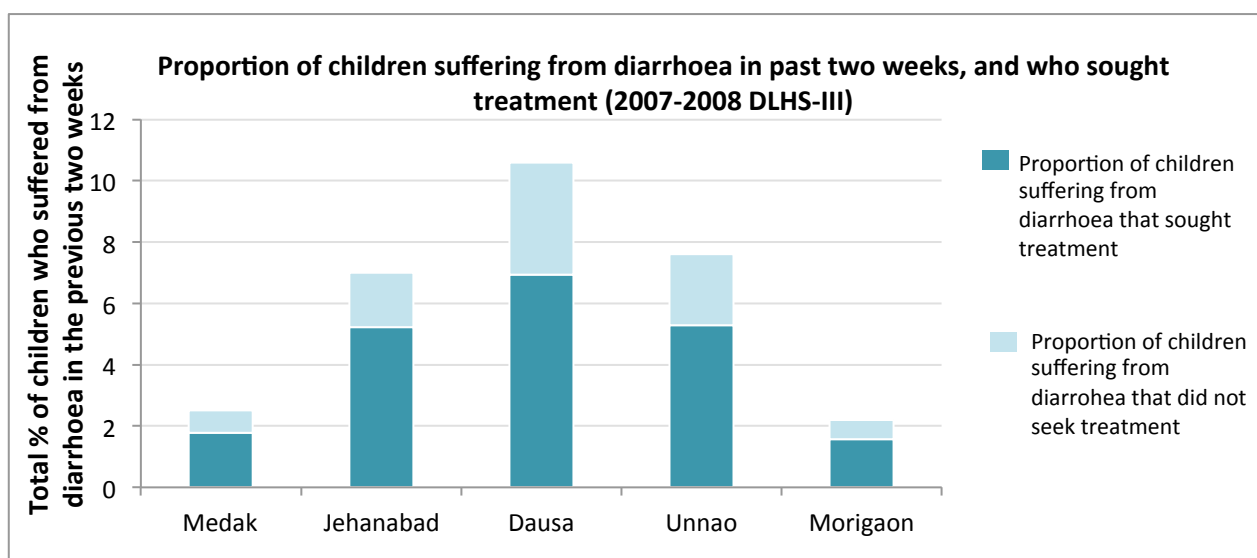
IMMUNIZATIONS



CHILDHOOD MALNUTRITION



CHILDHOOD ILLNESS MANAGEMENT



ANNEX 3

Critical intervention mix within the scope of the Model Districts project

| | UNIVERSAL COVERAGE | ADDITIONAL |
|------------------------|--|---|
| ANTENATAL CARE | <p><i>Preventative measures</i></p> <ul style="list-style-type: none"> Tetanus toxoid immunization (2 shots) Iron and folic acid <p><i>Detection and management</i></p> <ul style="list-style-type: none"> Pregnancy-induced hypertension (PIH) Severe anaemia Syphilis Eclampsia Multiple pregnancies or other complications <p><i>Counselling & preparedness</i></p> <ul style="list-style-type: none"> Birth and emergency plans Breastfeeding promotion | <ul style="list-style-type: none"> Peri-conceptual folic acid supplementation Detection and treatment of asymptomatic bacteraemia Antibiotics for preterm premature rupture of membranes Antenatal corticosteroids for preterm delivery |
| DELIVERY | <ul style="list-style-type: none"> Clean delivery practices Skilled obstetric care Newborn resuscitation Comprehensive emergency obstetric care (<i>see Table 4</i>) | |
| POSTNATAL CARE | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Injury prevention Full coverage LLINs |
| SICK CHILD CARE | <ul style="list-style-type: none"> 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* (<i>not yet in Indian guidelines</i>) | |

ANNEX 4

Functions of basic and comprehensive emergency obstetric care services

| BASIC SERVICES | COMPREHENSIVE SERVICES |
|---|---|
| <ul style="list-style-type: none"> Administer parenteral antibiotics Administer parenteral aoxytocic drugs Administer parenteral anticonvulsants for pre-eclampsia and eclampsia Perform manual removal of retained products Perform assisted vaginal delivery | <p><i>All services included in basic emergency obstetric care plus:</i></p> <ul style="list-style-type: none"> Perform surgery (cesarean section) Perform blood transfusion |

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