

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

Strategic planning experience from Assam

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INTRODUCTION

Providing at-scale, high-quality public health services in rural India is one of the country's greatest challenges. In 2005 the Ministry of Health and Family Welfare (MOHFW), Government of India, launched its flagship programme the National Rural Health Mission (NRHM) to improve rural access to quality primary health care. 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 the panel conducted a mid-term evaluation of the NRHM in 2009. The evaluation 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). The MOHFW and the IAP determined that efforts required to strengthen health systems towards meeting health Millennium Development Goals before 2015 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.

As we reported in our previous working paper², districts were deliberately chosen as the model unit for this proof-of-concept project because they 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, nutrition, education, water, sanitation, electricity, etc.). We will support operations in the following five districts: Morigaon, Assam (Northeast), Khunti, Jharkhand (East), Jhansi, Uttar Pradesh (North), Dausa, Rajasthan (West), and Medak, Andhra Pradesh (South).³ These five Model Districts will serve as regional pilots for scaling up innovations and quality improvements in infrastructure, data management, governance, financing, supply chain management, and frontline health worker capacity. In doing so, the Model Districts aim to emphasize integrated health planning and dynamic management (e.g. data-driven decision making). 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 streamline service delivery towards 'centres of excellence' that address existing challenges in designing, managing, and implementing scaled-up health systems.

ASSAM'S MODEL DISTRICT

The project in Assam's Morigaon District was launched in September 2010 by the Chief Minister of Assam, and is led in the State by the dynamic Minister of Health and Family Welfare⁴, and in the district by a committed District Collector and team. The Model District in Morigaon seeks to target additional health spending and strategic interventions to achieve Millennium Development Goals 4 and 5 by 2013. These targets include infant mortality rate under 30, child mortality rate under 38, maternal mortality rate under 100, and a total fertility rate of 2.1. Specific operational and uptake targets required for significant progress on the MDGs are outlined below.

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 'Model Districts as a Roadmap for Public Health Scale-up in India,' CGC Working Paper Series, No. 4

³ District selection criteria included: rural (urbanization <20%), accessibility from the capital city, and poor primary health indicators. 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 Assam held state elections in May 2011. The Chief Minister returned, and the Minister of Health and Family Welfare also assumed the Department of Education.

MODEL DISTRICTS TARGETS	
BUILDING BLOCKS	<ul style="list-style-type: none"> • 24*7 curative care and skilled attendance is available within 90 minutes walking • Emergency obstetrical care is available within 45 minutes • Emergency transport available for all community-to-facility and facility-to-facility movement within 20 minutes • 1 clinic visit per person per year • 2 ASHA per 1000 population • Remove financial barriers to care
CHILD HEALTH	<ul style="list-style-type: none"> • At least 75% of newborns receive four or more postnatal visits in the first 28 days of life • Over 90% of children under 12 months have received measles vaccine • Over 90% of children under 12 months have received Vitamin A • Over 90% of children under 5 years sleep under a treated bednet
MATERNAL HEALTH	<ul style="list-style-type: none"> • At least 70% of women have received at least three antenatal care visits during their last pregnancy • At least 80% of women deliver in an institution • At least 80% of women delivering in a facility remain in the facility for 48 hours of monitoring • At least 80% of women receive a postnatal visit in the home within 72 hours of delivery
NUTRITION	<ul style="list-style-type: none"> • At least 90% of children under five years are enrolled in a growth monitoring scheme • Stunting under 20% • Underweight prevalence under 10% • Wasting prevalence under 5% • Anaemia of children and reproductive-aged women under 50%

OBJECTIVES

In this paper we aim to discuss the Action Plan (AP) developed for Morigaon that is consistent with the broad objectives of the MDP and the site-specific requirements of Morigaon District in Assam. It includes our thinking behind how best to put together broad strategies and interventions along with additional public spending to try to achieve MDGs 4 and 5 within two years, a time-frame that the Assam Health Minister has boldly declared by which he would like to see Morigaon district achieving the goals which is ahead of the UNGA declared goal of achieving MDGs. This action plan presents a package of strategies that maximize available funds to target system breakdowns that lead to mother and child deaths, particularly bolstering health facilities to ensure local access to 24*7 care and safe delivery, building stronger community-based support and care management, and creating stronger emergency referral networks. The strategies outlined are expected to be high-yield if aggressively pursued in operational planning and funding.

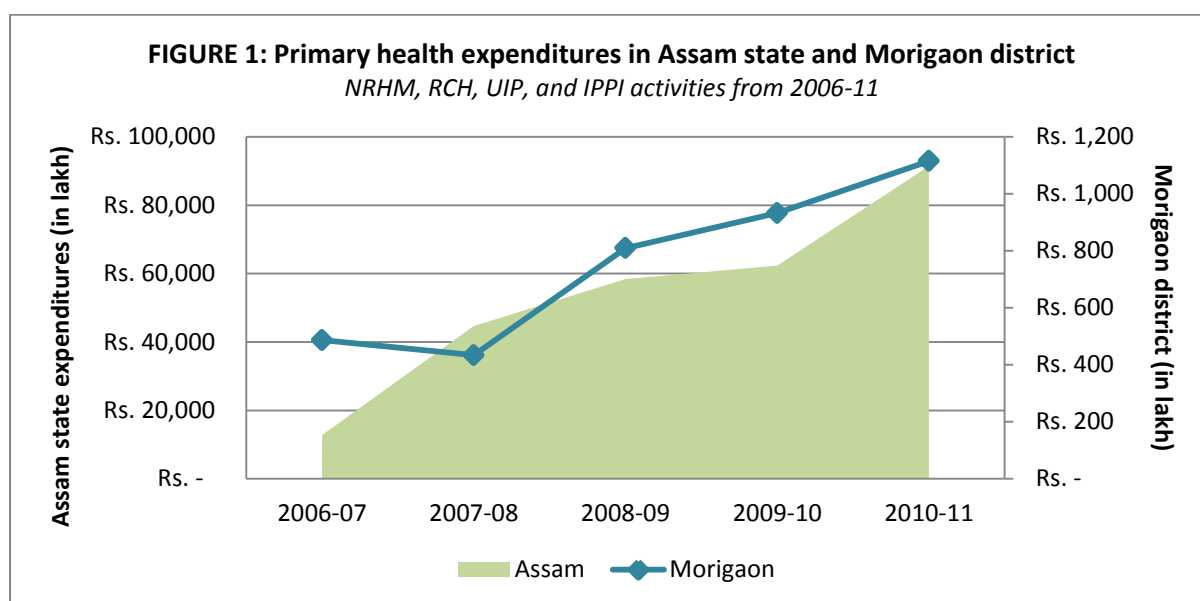
The proposed AP aims to provide a strategic starting point for the Morigaon Model District. Implementation planning will also require progressive thinking around key challenges—like systems accountability, particularly at facility level—and innovative ways to address these issues in the Model District. Before we get into the details of the AP and how we propose it be financed, it will be useful, we think, to describe some of the areas of success that Assam has witnessed since the launch of the NRHM.

ASSAM'S RECENT SUCCESSES

We believe that Assam has performed well using the additional resources and the flexibility provided by NRHM since 2005. State-wide data bears testimony to the fact that Assam has achieved great successes in maternal and child health over the last few years. These successes are exhibited in the steady reductions in both maternal and infant mortality rates.

Assam's latest reported maternal mortality rate (MMR) is 390 (2007-2009), a 90 point drop from its MMR in 2004-2006, when NRHM began.⁵ The infant mortality rate (IMR) has declined from 73 in 2001 (SRS 2002) to 58 (SRS 2010).⁶ Improvements in health service utilization are also indicative of Assam's progress. Yearly institutional delivery rates have increased from 149,003 in 2005-2006 to 418,284 in 2010-2011⁷, a remarkable scale up, and full immunization before 12 months of age reached 70% in 2009⁸. There are several key initiatives that have contributed to these recent rapid improvements.

First, health sector spending as a percentage of the SDP has more than doubled between 2006-2007 (.81% of SDP or Rs. 1,013 crore) and 2009-2010 (1.74% of SDP or Rs. 1,737 crore). While these spending increases are impressive and necessary, by comparison, Tamil Nadu's interim 2011-12 budget estimates health spending as 5.8% of SDP.



This additional investment in public health in Assam has been focused on key infrastructure improvements, manpower strengthening, facility accessibility, and incentive programs to motivate increased use of health services. Under NRHM, 464 additional labor rooms, 22 newborn care units, and 402 newborn stabilization units, and four nutrition rehabilitation centers have been constructed.

Second, the health workforce has been strengthened through the introduction of 182 rural health practitioners throughout the state, additional specialty training for in-service medical officers, and the creation of three new medical colleges, eight general nurse midwife schools, and two bachelors of nursing schools. Additionally, the introduction of mobile medical units, boat clinics, and partnerships with private hospitals has increased facility accessibility.

Third, Assam has initiated several incentives to encourage women and families to utilize health services. For example, the Mamoni Scheme provides Rs. 1,000 to pregnant women during ANC visits for nutrition, and private ambulances have been contracted for emergency transport free of charge,

⁵ 2007-09 and 2004-06 Sample Registration System, Government of India

⁶ According to the 2010-11 Annual Health Survey, Registrar General, Government of India, Morigaon district's IMR (total, rural) is 74. This was the baseline year for AHS.

⁷ State HMIS data reporting

⁸ Coverage Evaluation Survey (2009), Regional Resource Center for North East States, Ministry of Health & Family Welfare, Government of India. The last national health survey reporting rates of full immunization at 12-23 months, DLHS-III (2007-08), reported rates at 50.9% in Assam.

in addition to the JSY benefit provided to women who deliver at a health institution.

Based on these successes, the Government of Assam, guided by the Minister of Health and Education, is intent on achieving the MDGs in Morigaon, as a guide for statewide success by 2015. He is mobilizing the administrative and political leadership towards this goal. He believes that using Morigaon as a Model District will have powerful positive lessons throughout the state, and hopefully, throughout India.

ASSAM ACTION PLAN: STRATEGIC FOCUS AREAS

During our collaborative situational assessment in Morigaon, we have identified a number of key delivery challenges that will be targeted in a streamlined strategy. Our action plan asserts that maternal and child mortality in Morigaon District are being driven by long travel times to reach services, underutilization of community and village-level health services, and insufficient home-based outreach for management of malnutrition. This is furthered complicated by inadequate human resource capacity at the facility level, minimal ability district-wide to be able to perform comprehensive emergency obstetric care, and isolation of communities in char regions and areas prone to seasonal flooding.

1. Infrastructural requirements and quality controls

The infrastructure strategy aims to improve the availability and utilization of preventative care at primary level facilities, equip facilities in targeted areas of high home delivery with capacity for safe delivery at sub-centre level, and ensure appropriate number of facilities is operational to provide comprehensive emergency obstetrical care (CEmOC).

Strengthening sub-centres (SC)

Despite NRHM's stress on decentralizing services, sub-centres in Morigaon are largely under-equipped, underutilized, and poorly monitored. This necessitates further travel for care and places additional stress on higher level facilities. More timely curative care, particularly for children under-five, and more easily accessible points of safe delivery will impact morbidity and lessen patient loads on higher-level facilities, allowing them to better function and provide emergency or specialized care. With increased capacity and stronger functioning, sub-centres are well-positioned to deal with the most common causes of illness for women and children. In the action plan there are a number of strategic points to address service delivery at the primary level, particularly: (a) the availability of local 24*7 care including safe delivery, and (b) full-time preventative care services within short travel distances.

These major strategic infrastructural components⁹ will include:

- a. Increase availability of 24*7 services, particularly delivery, at primary level by placing Rural Health Practitioners (RHP)¹⁰ and skilled birth attendants (SBA)¹¹ in targeted areas that have significant numbers of home deliveries. These areas were prioritized during a collaborative micro-mapping exercise with block programme managers; in some areas they require new sub-centre construction and in others, upgrades to existing facilities.

⁹ Other important strategic elements for increasing sub-centre quality and utilization, including ANM training and job support, and community mobilization and awareness campaigns, are discussed later in the strategic plan. Substantial public awareness efforts are required to inform localities about availability of services, and community monitoring efforts are required to ensure upgrades and quality are maintained.

¹⁰ Assam is early in the rollout of Rural Health Practitioners (RHP), who are recruited from rural areas and trained under the supervision of Jorhat Medical College. The training and programme is modeled after Chhattisgarh's Rural Medical Assistants (RMA) four-year curriculum and placement in PHC and sub-centres.

¹¹ SBA-trained Auxiliary Nurse Midwives (ANM), Lady Health Visitor (LHV), and General Nurse Midwives (GNM)

- b. Upgrade all other SC to provide preventative care and basic primary/referral care during daily hours (7 hours a day, 6 days a week). Regular and full-time hours are critical for optimizing the primary healthcare system. First, this can be achieved by reducing ANM duties so that she is only focused on facility-based care; an upgraded ASHA system can be largely responsible for home visit and community-based programming. Second, these facilities require support from more comprehensive referral transport systems.
- c. Ensure consistent and adequate supplies and medicines at primary level by an informed push or pull system that can account for fluctuations in demand (e.g. seasonal, utilization rates¹²).
- d. SC must be adequately staffed by ANM and security/cleaning personnel, and quarters provided in the difficult-to-reach areas. Given the challenges for retaining staff at some isolated posts, we have recommended 'hardship allowance' addition to the base salary for designated health workers at specific high-focus SCs and PHCs. Job stationing should also account for a health worker's locality and local requirements (e.g. if female RHPs are requested in some Muslim communities).

Sub-centres have potential to provide the crux of preventative care in NRHM, and should be equipped to fully meet NRHM's vision for decentralized primary care.

Strengthening key gaps in primary health centres (PHC)

Primary health centres are currently overburdened and under-equipped, and are not functioning as the semi-referral facilities they are envisioned as in NRHM. They require significant staffing and infrastructural upgrades¹³ in order to be able to provide 24*7 safe delivery, and the allocation of space for women and babies to remain in these health institutions for 48 hours post-delivery for monitoring. As additional support during the period of postnatal feeding, counselling, and monitoring, we are proposing the introduction of postnatal counsellors.¹⁴ The action plan has also proposed the construction of pre-delivery huts, on a pilot basis, at strategic PHCs that serve isolated and/or flood-prone areas.¹⁵

¹² Supply chain management should account for anticipated consumption increases —currently sub-centres are open for about two days of outpatient services, while we are recommending daily services. Current SC drug kits (usually delivered twice a year) are not designed for more regular service delivery.

¹³ Recommended upgrades include suitable single-sex inpatient ward space (6-10 beds each), pre/post-partum wards with 4-6 beds, newborn care units (equipped with radiant baby warmer and suction apparatus), a facility management office, staff quarters for non-local staff, and kitchen.

¹⁴ Justification for postnatal counsellors: Female peer counsellors stationed in facilities can conduct demonstration-education and counselling for mothers and caretakers on critical nutrition interventions and care for infants. An on-site peer counsellor can immediately capture women and caretakers in the ward immediately postnatal for very specific counselling interventions. Health counselling programmes around the world have emphasized that peers have success in accessing beneficiaries, gaining trust, and staying with beneficiaries (while nurses or clinicians are called away) to further advocate for, and clarify, good care practices. Our action plan costing assumes an incentive 100 Rs. for every postpartum mother counselled. Operationally, postnatal counsellors serve as intermediary support to ASHA, AWW, ANA, ANM, and hospital nutritionists. They will require training on essential care and critical nutrition messages, and their scope should remain very specific and focus on advocating for a finite number of practices. A postnatal counsellor, called a *yashoda*, has been included in the state NRHM programme implementation plan (PIP) in Rajasthan, Bihar, and Orissa. This position was initially launched by the Norway India Partnership Initiative, and this well-developed model's operational guidelines and resource tools can be made available in the Model District. In 141 facilities *Yashoda* impact includes higher percentages of immunizations before discharge, early initiation of breastfeeding, higher proportions of newborns weighed for growth monitoring schemes, increased duration of stay for mother and baby in the hospital, and reduction of overburdening on nursing staff.

¹⁵ One of Morigaon's key challenges in ensuring safe delivery is accessibility. In areas that are flood-prone, hilly, and only accessible by poor, non-formal roads, traveling to the health institution for delivery either becomes a non-option or a deathly option for pregnant women. Furthermore, ASHAs and dhais themselves are unable to travel to these women's homes to at least ensure safe home delivery. As a result, many women in these areas are unaccompanied by skilled birth attendants during home deliveries or experience serious complications in transit to the health facility. Employing a pre-delivery hut model, as has been done successfully elsewhere in India and a number of other countries, can provide a safe space where women can wait on-site at the facility in the days before her estimated date of delivery (EDD). In this model,

Ensure adequate coverage of CEmOC

Given Morigaon's census population figures of nearly one million, there should be three operational First Referral Units (FRU) to provide CEmOC¹⁶. At present, only the district hospital is able to perform caesarean sections, as the other designated FRUs are not functioning due to poor facilities and management, and one site is under construction. The action plan seeks infrastructural upgrades at both the non-operational site, and a block PHC that services a large flood-prone area. Infrastructural upgrades include blood storage units, renovated operation theatres, post-operation wards, quarters for non-local staff, and furnishing and equipment. Meeting requirements for CEmOC-skilled staff is later discussed in our training strategy.

2. Increasing capacity for community-based care management

As the cornerstone of NRHM, the Accredited Social Health Activist (ASHA)¹⁷ has a direct impact on how well services are decentralized to the village level, and how well communities mobilize for care. Assam has set a precedent for many states by establishing a state-level support centre and network of district mobilizers and ASHA supervisors.¹⁸ Our action plan proposes a number of strategies we believe will further streamline ASHA activities for greater public health impact, and provide stronger support in the field. These strategic components include:

- a. Diversifying and incentivizing key home-based activities for ASHA that are critical care but currently not included in the formal scope of work (e.g. newborn visits, sick child care, key gaps in administrative work). In order to streamline ASHA responsibilities and focus skill sets, we have recommended that the state recruit and train two ASHA per 1000 population; one will serve as a Mother-Baby ASHA, and the second as a Child ASHA.¹⁹ Trainings and refresher courses are required to refocus tasks and skill sets, and address challenges from the field. Easy-to-use job aids should be developed as the cornerstone of trainings and in-the-field training and continued mentorship.
- b. Ensuring that an incentive structure for ASHA is motivating and provides some level of economic security. To this end, we have recommended top-ups for key activities (e.g. course of antenatal care, birth accompaniment, immunizations). Our action plan costing exercise estimated a monthly incentive package of approximately 3000INR per ASHA; according to qualitative reports, ASHA in the district currently earn about 1500INR a month.
- c. Shore up existing ASHA workforce by: (a) conducting a performance assessment on ASHA hired since 2006 and release those who are no longer working or performing; (b) recruiting, selecting, and training ASHA to fill existing gaps in the population ratio (1:1000), as the district is currently short at least 54 ASHA, an uncovered population of at least

pregnant women in high risk areas are brought to a safe and comfortable place where they can stay for a few days prior to their expected delivery date. These delivery huts should be strategically located next to institutions capable for 24x7 delivery, and as close to hard-to-reach areas as possible. They should be a clean, hygienic location with on-site food available for a pregnant woman and her family attendant, so that she has immediate access to healthcare as soon as she enters labour. The hut should be tended to by a security guard and a lady care taker, who should be from the same PHC locality, and can also cook. Block managers in Morigaon have locally named these pre-delivery huts *matrimangal kutir*, or a mother's wellbeing hut. As the success of these huts is very culturally dependent, we recommend piloting this strategy.

¹⁶ Model Districts has set a target to ensure that CEmOC care is available within 45 minutes of transport.

¹⁷ For additional information about the ASHA, please see *Improving the Performance of Accredited Social Health Activists in India*, CGC Working Paper Series No 1.

¹⁸ The State ASHA Resource Center (SARC) is managed by the Don Bosco Institute in Guwahati; the SARC is charged with developing training, job support, and technical resources for state ASHAs. District Community Mobilizers (DCM) and assistants are stationed as liaisons and training point persons in each district. ASHA supervisors are each responsible for 10 ASHA in the field, and are expected to conduct in-the-field mentoring and job planning.

¹⁹ In our action plan, these two ASHA roles would have separate responsibilities and be incentivized for separate activities, to avoid conflict or competition between health workers. Each ASHA would be trained on a specific set of tasks: (a) Mother/Baby ASHA on motivating mothers for timely antenatal care, birth planning, accompaniment for institutional delivery, and postnatal follow-ups, and (b) Child ASHA on growth and development monitoring, IMNCI, immunizations, IFA for women 15-49 who are not pregnant. Both ASHA would be trained jointly with ANM and AWW on processes for birth/death reporting, enrolling eligible couples for bank accounts, family planning, and growth monitoring.

- 54,000 in Morigaon, and at least 25 ASHA in the char areas; (c) provide immediate basic training to existing ASHAs who are working in the field without having any days of training in order to maximise productivity and minimise potential harm until new training programme is developed; these untrained ASHAs number over 100.
- d. Ensure adequate supervision and management for ASHA by recruiting and selecting additional ASHA Supervisors (to maintain a 1:10 ratio) and ASHA managers in each block, who will work with the District Community Mobilizer to manage supervisors, a regular performance review, training calendars, and supplies.

3. 24*7 and timely referral transport services

Referral transport services in Morigaon are currently provided through GVK EMRI 108²⁰ services and facility-based ambulances²¹. Of note, our action plan coincides with the rollout of the Janani-Shishu Suraksha Karyakram scheme, which intends to guarantee, among several other service components, free transport for all pregnant women, newborns, and sick children to and from the home, and between facilities. JSSK provides an additional urgency to ensure adequate coverage and management in referral transport services. In the scope of our action plan, we have identified three key challenges in the ability to provide timely access to emergency care for women and children in Morigaon.

First, while 108 ambulances are the most efficient and safe way for transport from the home to the health institution, the time of pick-up can range from 45 minutes at a minimum to over 1.5 hours. Additional 108 ambulances are required for adequate coverage. Second, PHC ambulances, which are largely intended to be available for facility-to-facility referral, are available in 10 out of 31 health institutions, and in the 21 ambulances that are available in the district are often not functioning (e.g. maintenance issues, driver unavailability). Third, ambulances are unable to reach substantial populations in the char²², flood-prone²³, hilly, forested, and otherwise difficult to reach areas. These areas are severely limited to health system access, often resulting in deaths at home or during late transport. Emergency transport vehicles will be critical in ensuring women in labour and children with emergencies have access to healthcare, therefore reducing maternal and child death.

Given these challenges, our action plan outlines the following capital and management investments in order to improve the referral transport coverage, timeliness, and efficiency, and particularly for delivering institutions:

- a. Ensure a centralized management system that can coordinate all incoming referral transport requests and ensure driver dispatch. This centralized management system should specify between facility-home transport and facility-facility transport, and between emergency and non-emergency²⁴ transport.

²⁰ GVK EMRI 108 services are a private-public partnership model for 24*7 emergency services. The Government of Assam began contracting 108 ambulances in 2008. Vehicles are equipped to provide pre-hospital care, with an EMT. Services are free of charge to the patient. 108 ambulances are dispatched through a centralized system; the ambulances are usually stationed on local police station property.

²¹ Facility-based ambulances are not linked into this centralized dispatch system, they are managed by facility administrators. Drivers are contacted directly for services. As a result, NRHM units report, drivers may not answer calls or choose to go for a pick-up in a particular location, or at night.

²² The char consists of riverine islands within the Brahmaputra River that borders Morigaon to the north. There are an estimated 30,000-45,000 people living on riverine islands in Morigaon. The islands' accessibility and size changes seasonally. Please see further char-specific strategies later in this paper.

²³ A substantial proportion of the district is prone to seasonal flooding from the Brahmaputra. Low-lying areas throughout the district can stay under water for several months (e.g. in 2010, flooding began in April and remained through September). Our pilot block, Jhargaon, estimates that over 30% of the block is flood-affected, during which vehicles are not able to travel on low-lying or non-concrete roads, flood waters are not high enough for boat transport, and carts also sink.

²⁴ This includes the free facility to home transport provided to mothers and newborns in the JSSK scheme.

- b. Include innovative transportation in difficult-to-reach areas including a boat ambulance network in the char²⁵, a set of four-wheel drive vehicles in isolated areas with persistently muddy or *kaccha* roads, and a set of motorcycles with EMT responders.²⁶

Utilization will require a significant information, education, and communication campaign to ensure public awareness about emergency numbers, availability, and expectations for service.

4. Streamline training priorities ²⁷

Human resources for health, both administrative and technical, are only as effective as they are trained to be. In order for the health system to perform efficiently and at its best, each tier within the system, from administrative employees, to senior and junior technical staff, to community workers, must be regularly trained and oriented towards the key health goals within the district. Trainings span the spectrum of motivation, management, and skills in order to equip the workforce with the drive and ability to enhance the health system. These components include:

- a. Ensure human resources and infrastructural support for a full-time training structure; as the administrative structure stands, district officials and medical officers are responsible for organizing training calendars, managing logistics, and service as master trainers. The district is considerably behind on its training goals. We have proposed a full-time district-level and block-level technical training managers to ensure rapid progress on training calendars and field-level mentorship. We have also proposed additional training space for the district, which comparatively little space, by method of outsourcing hostel space (for immediate need) and repairs to other government buildings that could be used as training facilities.
- b. Motivational training for all district administrative and technical staff, highlighting maternal and child health goals set by the district, expectations for performance, and rewards to highlight outstanding performance.²⁸ This will include a new joint training for ANM, ASHA, and AWW focusing on roles for Village Health and Nutrition Day (VHND).²⁹
- c. Immediately provide a streamlined training for skilled birth attendance and Navjat Shishu Suraksha Karyakram (NSSK)³⁰ for ANM and GNM required at 24*7 delivery facilities.
- d. Immediately provide all sub-centre ANM with refresher training on quality antenatal care, including reporting and referral systems, and diagnostic requirements that have been highlighted as gaps (e.g. haemoglobin and blood pressure testing).
- e. Immediately provide specialist trainings for medical officers placed in PHC, CHC/FRU, and the district hospital, as allocated, for short courses³¹ in: (a) paediatric and neonatal management, (b) anaesthesia, and (c) gynaecology, safe abortion, and IUCD insertion.

²⁵ This strategy is further described in our char service strategy.

²⁶ As has been implemented in other districts in India, employing emergency medical technicians, or paramedics, to make emergency house calls on a two-wheeler can also increase access to medical care in cases when travel is difficult and facility-based care is not necessary. It is also necessary to note that these transport strategies in very difficult-to-reach areas are not substitutes for building sub-centres—and providing staff hardship allowances, security, and housing quarters—that can serve these communities. Decentralizing the health system into these areas is high-yield and more sustainable service delivery. These two-wheel vehicles will not be suitable for transporting pregnant women, and in these cases, should not be a substitute for timely referral transport.

²⁷ To note, the current state training budget is underutilized and has the capacity to implement all of our recommended strategies, thereby training was not included in our costing exercise.

²⁸ Honorable Chief Minister Gogoi would like to give a Chief Minister's medal each year to an outstanding member of the Model Districts district/block team.

²⁹ VHND is held monthly at each village, and is a collaborative effort by the ANM, AWW, and ASHA. It is usually held at the AWW. The ANM conducts antenatal visits, provides immunizations, and delivers health talks. Despite VHND's potential as a space for key health workers to collaborate and capture local mothers and children for care, VHND is widely underutilized and poorly monitored. The day needs to be redesigned in order to maximize interaction (e.g. mothers do not wait for the health talks, which are conducted after all mothers and child have been seen), and ensure cross-reporting between health workers (e.g. on childhood illness and growth monitoring).

³⁰ NSSK training focuses on critical newborn care, including resuscitation, breastfeeding, critical care practices.

³¹ These courses are already designed and available in Assam.

- f. Immediately provide IMNCI training to designated ASHA, AWW, and ANM as district referral strategies will require.³²

Our action plan strategy reinforces that training needs can only be met if the appropriate structure is in place, and this will require immediate manpower and infrastructural allocations. A full-time training structure can more effectively drive a training calendar forward for identified training gaps, and better coordinate master trainers and trainees so that health workers are not unnecessarily overburdened with training time. The state Institute for Health and Family Welfare has very energetically supported the training strategy, and will provide the technical support required for training streamlining and tool development, particularly in new areas (e.g. VHND strengthening).

5. Building intensive strategies for char, flood-prone, and culturally sensitive areas

As this paper has previously discussed, char communities are some of the most isolated in the district, and have not been reached by the health system until the recent introduction of mobile boat clinics.³³ Given the char communities' isolation—both physically and socio-culturally, as many are migrants—and extreme poverty, we suspect that the area has serious rates of maternal and child morbidity and mortality, but there is no formal data collection in the area so it is a black hole in planning. Flood-prone areas account for a significant proportion of the district—30% in some blocks. These areas will require additional outreach, referral transport, and safe delivery strategies.

Our action plan for chat and flood-prone areas focuses on: (a) introducing the primary care system to the area, (b) reinforcing community-based care through ASHA and *dhai* (traditional birth attendant) collaboration, and (c) increase referral transport capacity. Char strategies are pilots in many senses, as an exceptional area in its delivery challenges and longterm isolation. Specific strategic components will include:

- a. Create a structure for more regular primary care, which has two components. First, procuring a larger mobile boat clinic³⁴ that has accommodations for clinical staff, enabling them to spend three to four days on the river visiting char areas and maximizing clinical time. Staff currently drive from Morigaon city for a day's trip out to one char a day. Second, building a sub-centre on the char's largest island, which has a substantial population (an estimated 3,000 people) and is accessible throughout the seasonal fluctuations in river levels. We recommend that an ANM post here be incentivized with a hardship allowance, and be monitored weekly by mobile boat clinical staff.
- b. Reinforce an emergency referral transport network to link outlying island communities to the health system (e.g. sub-centre and docked mobile boat clinic). We have recommended a network of ten referral speedboats,
- c. Prioritize strategies for safe delivery, including: the immediate posting of required ASHAs for community mobilization and accompaniment; providing a financial incentive to *dhais* for bringing women to an institution for delivery; and in the exceptional (and non-incentivized) cases of home delivery, train char *dhais* on safe delivery practices, newborn resuscitation, and cord care.

Our action plan anticipates unique challenges in the char communities, but given the area's population size and lack of care to date, believe that interventions here could have significant public health impact.

³² To date in Morigaon, IMNCI training has been largely provided to AWW, and to very few ANM. ASHA training modules 6 and 7 incorporate the IMNCI algorithm, but have not been rolled out.

³³ At present, there is one mobile boat clinic serving a total char population of 35,000 in 45 villages; there are no char sub-centres. The mobile boat and its staff are based in Morigaon city and take the boat clinic to one char every other day, thereby at best serving every village once every 6 weeks for 2-3 hours. One referral boat is stationed on the river bank, but cannot quickly or effectively reach communities in a char area that spreads over 7 hours of upstream river travel time.

³⁴ This has been in the pipeline and is already funded, and Model Districts momentum should ensure its operationalizing in the coming months.

6. Targeting nutrition programming

As an exercise in integrated health services, the Model District in Morigaon must implement an equally aggressive approach to nutrition programming for young women and children. While the formal nutrition programming—ICDS, or the Integrated Child Development Scheme—falls under the Ministry of Women and Child Development (WCD), NRHM envisions a rural health system that is deeply integrated with local nutrition programming.³⁵ AWC are well-placed to provide nutrition interventions at the community level, but they are not systematically delivered or targeted.³⁶ Given the tremendous impact of malnutrition in India, the Model District must pursue innovative nutrition programming pilots. Our action plan for nutrition focuses on streamlining operations to better target malnourished children, build out protocols for referral and management at the community level, reinforce home-base nutrition action, and improve monitoring and support of anganwadi workers (AWW). Specific components include:

- a. Immediate reinforcements to anganwadi centre (AWC) monitoring. First, this requires recruitment of AWW supervisors, who are currently at an estimated 1:40 or 1:60 ratio in Morigaon.³⁷ Second, this requires streamlined record keeping at the centre; we have recommended piloting an AWC registrar that focuses on only the most critical and actionable data points; we have learned that AWC report over 100 data points and only four are analysed centrally.
- b. Improving the targeting of AWC services through: (a) consistent methods of growth monitoring, including a baseline and regular follow-up at the home by the ASHA or an additional nutrition outreach worker,³⁸ (b) rapid reporting methods (e.g. by mobile phone) of key indicators to facilitate on-the-job support and quick action,³⁹ (c) protocols for managing and referring children who are moderately and severely malnourished, and for collaboration between the ANM, AWW, and ASHA on these children.
- c. Maximizing operations in Morigaon's AWC, and in the immediacy, releasing AWW with poor attendance and performance, and addressing breakdowns in the supplementary nutrition supply chain.⁴⁰
- d. Including provisions for universal iron-folate supplementation for women of reproductive age (15-49), for distribution and tracking by ASHA during household visits and VHND.

Our action plan has initiated introductory planning conversations with WCD in Assam, and our team will develop further detailed action plans with these units. The operational planning and implementation of these interventions will involve both the WCD ICDS teams and NRHM nutrition teams at district and state. Given the management structure, nutrition programming was not included in our action plan costing exercise.

³⁵ For more background on nutrition programming in India and recommendations for further integration with health services, see *Improving the Integration of Health and Nutrition Sectors in India*, CGC Working Paper Series No 2.

³⁶ AWW weigh children, but growth monitoring is not regularly tracked or reviewed in collaboration with the ASHA and ANM. AWC do not track children with moderate or severe malnutrition in real time, and Morigaon does not have strong protocols for referral or management beyond additional supplementary food. The district does not have a nutrition rehabilitation centre (but we have not yet determined if it needs one; the state has built several NRC in the past years).

³⁷ A recently lifted hiring freeze should facilitate supervisor placements.

³⁸ We outline a recommendation for such a worker, named an Accredited Nutrition Activist (ANA), in our working paper number 2. The ANA is designed in a services model similar to the ANM (facility-based) and ASHA (outreach worker), where the AWW would provide AWC-based services and the ANA conduct home-based growth monitoring, nutrition demonstration-education, and targeted counseling.

³⁹ In planning exercises with ICDS and NRHM staff, and supported by international best practices, these have been prioritized as weight, height, mid-upper arm circumference (MUAC), and presence of edema. In Earth Institute-supported Millennium Village Project sites throughout Africa, community health workers use an SMS-based technology called ChildCount+ to report MUAC and edema over mobile phones, and receive immediate responses (based on an algorithm and the child's identification number) on what actions should be taken with the child.

⁴⁰ AWC supplementary nutrition will be included in a wider analysis and action plan on procurement and supply chain management in the Model District.

7. Increasing capacity for active, data-driven management

Health planning and management is currently severely limited at the district level due to the lack of real-time data use. Integrated health service provision and utilization is a dynamic process that requires important data to be immediately collected, analysed comparatively (e.g. across time, place, and intervention), and collaborative, corrective actions. Currently data is largely underutilized, and when it is reviewed, it is only in its absolute figure from a given month (e.g. number of institutional deliveries last month in the district), which does not allow for a more dynamic analysis (e.g. proportion of reported deliveries in X block that were in an institution, and viewed over time, and compared to other blocks). While significant efforts to create more comprehensive and timely data systems⁴¹ should be applauded, our action plan emphasizes the need for streamlined management tools and support staff at the district level to ensure more informed planning and monitoring. The key strategic components of an active management strategy include:

- a. Reinforce death reporting—which is critical for health planning but largely not systematic—by hiring a mortality reporting coordinator to oversee the full implementation of a reporting system (including verbal autopsy), coordinate and analyse mortality and epidemiological data reported (e.g. HMIS, verbal autopsy), and to conduct monthly morbidity and mortality reports at district and block health meetings.
- b. Building a district- and block-level management portal⁴² that tracks key indicators by block, and displays data dynamically (e.g. across district, over time) and visually. This portal can draw from existing HMIS data collection, so it does not add burden to staff, and can also be validated by other data sources (e.g. impact surveys, MCTS, national surveying).
- c. Streamlining job profiles at district and block-level NRHM units to maximize performance. We have recommended adding positions in areas of critical need (e.g. technical training coordinators, support administrative staff), and revisioning other roles (e.g. the largely male multi-purpose workers that are stationed at facilities and largely doing malaria outreach, but could be tasked and trained for family and male-specific outreach in family planning and seeking health services).
- d. Targeting logistical hold-ups for scheme disbursement in the district.⁴³

As a closing point in our strategic plan discussion, we want to emphasize that in addition to the technical staff and health infrastructure, the administrative and operational teams and infrastructure are crucial for providing the overall health system the support it needs in order to provide quality health service delivery. Operational teams at district and block levels must be fully equipped – both in terms of personnel and equipment – to handle the management of a workforce of hundreds of people and the oversight of infrastructure quality of hundreds of health institutions in the district. Well trained and well equipped administrative and operational teams form the

⁴¹ The Ministry of Health and Family Welfare’s HMIS system is now electronically entered and analysed; Assam has created a supplementary form to track state-specific data and schemes; the Mother and Child Tracking System (MCTS) was launched in the summer of 2011 to begin tracking individual-level (mother-baby pair) service utilization and requirements.

⁴² The Earth Institute has developed such a project information system in the Millennium Villages Project; the system operates offline and enables managers to track key service and outcomes indicators in a visual format.

⁴³⁴³ We include two examples in our action plan. First, the Mamoni nutrition scheme for women is released quarterly, and always delayed in disbursement; the Health Minister has agreed to transfer fund pool annually for quicker distribution at the district level. Second, the JSY incentive for institutional delivery is often delayed because mothers have not yet opened a bank account, as required for the deposit. We’ve recommended several strategies, including: ASHA incentives for arranging bank paperwork for eligible couples (not necessarily waiting until pregnancy), rural registration camps with banks, and partnership with banks to offer ‘no frills’ accounts for JSY recipients. Lastly, ASHA mobile phone transfers have been piloted elsewhere in the country with success (e.g. Norway-India Partnership Initiative) and we recommend an exploration of the same. Assam has been quite successful in implementing electronic funds transfers for ASHA, but a mobile platform might further reduce travel time to and from banks, and potential opportunities for exploitation from those responsible for funds.

fulcrum that maintains the balance of the health system; emphasis on these will allow the health system to smoothly provide quality care for mothers and children in the district.

PUBLIC SPENDING ESTIMATES

For the scale-up of the aforementioned strategic plan to Morigaon's population of roughly one million, we recommend Rs. 192 million in fixed costs over three years, as per the Health Minister's interest in achieving health and nutrition goals by 2013. This expenditure amounts to under Rs. 90 (under \$USD 2) per person per year. These funds are largely dedicated for renovation and upgrading of health facilities (sub-centres, PHC, CHC), construction of staff quarters, and construction of new sub-centres. Our proposed estimate for annual recurring costs is Rs. 159 million per year, for three years. The larger recurring costs include stronger ASHA incentives, salaries and job support for new health workers, running costs for a rejuvenated referral transport system, operational costs for new and upgraded facilities, and additional requirements for medicines and supplies. Our costing exercise is a conservative estimate and we believe that an even larger (but still very modest) sum is likely to be required per person per year, given the high stakes involved and the enormous demonstrated benefits of success in India and internationally.

In summary, our back of the envelope estimates recommend \$USD 50-60 per person, per year, in public health spending for primary care (e.g. infectious diseases, safe childbirth, nutrition related illnesses, preventative family care, curative care for children under five). This compares with roughly \$USD 20 in per capita public health spending in India today—a rough estimate of around 1.5 percent of GDP times an estimated \$USD 1,300 per capita. By the end of the current decade, if not sooner, India should aim for three to four percent of GDP towards public health spending (>\$USD 2,000 per capita) in order to exceed the \$60 per capita threshold.

We strongly believe that with additional resources, and the remarkable leadership at the state and district level in Assam, Morigaon District can indeed leapfrog in performance and demonstrate for the rest of Assam and indeed for rural India as a whole that health MDGs can be achieved rapidly, and thereby save large number of lives of both infants and mothers.

However, it is important to note that the success of the implementation of the proposed Action Plan for Morigaon depends not only on approval of additional funds, but critically on true government buy-in, timely disbursement of funding for Morigaon, thoughtful development and execution of an operationalization plan, proper recruitment of strong administrative personnel, proper orientation and motivation of district technical and administrative staff, and awareness building among the Morigaon community.

CONCLUSION

Given the stated objectives of the government, whether federal or the states, one would ask if the state has universal health care and poverty alleviation as its basic objectives; if there have been gains, however patchy and inadequate over the years; if there are systems in existence though not actually thriving, why is the current health scenario what it is in rural India? In a broad sense, the answer perhaps lies in a mix of the following: partly due to the mismatch between these objectives and the limited resources being spent to achieve them; partly on account of the compartmentalized governmental system wherein for instance health, nutrition, access to safe drinking water and sanitation function as separate and very distinct governmental departments with little if any synergy or coordination among them; and finally and perhaps most importantly while additional public spending is critical, it certainly is by no means a sufficient condition to ensure success. Higher public sector outlays and spending needs to be accompanied by sectoral policy, institutional and

governance reforms which will pave the way for improved models of service delivery. Be that as it may, these issues are out of the scope of the present paper and hence will be the subject matter of our next paper in the MDP working paper series.