

Nyaya Health 2009 Program Expansion

June 2009



Nyaya Health 2009 Program Expansion: Proposal for Rob West

This proposal will outline four key priorities in Nyaya's program expansion for the 2009 fiscal year. The document was developed to be used for the purposes of further planning for specific funding and continued support for Nyaya Health programs. The proposal will in particular discuss:

1. Nyaya's development and construction of inpatient services;
2. Nyaya's planned x-ray and teleradiology program;
3. Nyaya's community health worker network; and
4. Nyaya's expansion of energy resources for Bayalpata Hospital.

While the numbers in this document represent accuracy to the best of Nyaya's knowledge, they remain subject to change as designs and implementation evolve. Updates, current budgetary and costing estimates, as well as all Nyaya data and protocols, can be accessed at wiki.nyayahealth.org.

1) Meeting the need: Nyaya Health and Bayalpata Hospital Inpatient services

Overview and Rationale

Through our experiences caring for the community in Achham, and through our discussion with the local community and government, it has become clear that essential inpatient services must be provided to adequately address the current health inequities. The maternal health situation is particularly dire in this area, with best estimates indicating that a pregnant woman is 100 times more likely to die in childbirth in Achham (nearly one in 100 pregnancies) than in the United States. One of the primary contributing factors to such a high maternal mortality rate is that close to 100% of births take place outside of healthcare facilities – to properly address this, Nyaya must develop sustainable inpatient healthcare services. We have begun to address the lack of infrastructure through our primary care clinic, which has a small capacity for inpatients (2-3), however is ultimately inadequate for the need. In this vein, in April of 2009, Nyaya Health signed a contract for formal collaboration with the Nepali Ministry of Health and Population to renovate and open the previously abandoned Bayalpata Hospital – located within 3km of Nyaya's current clinic.

Approach

The renovation and expansion of services at Bayalpata Hospital began in May 2009, and will continue in a phased progression through 2011. In keeping with the model we have developed at our clinic, the expansion to provide these services will complement general primary care and serve as a community-driven initiative to provide training, sustainable infrastructure, and high-quality medical standards for service delivery in the region. Furthermore, our collaboration with the Ministry of Health and Population will ensure continued financial support, as well as a direct relationship by which Nyaya can aid in furthering the development of best practices in health care delivery in rural Nepal.



As a key priority in the opening of Bayalpata Hospital, the renovation and implementation of inpatient services will begin immediately, however also be scaled-up in a step-wise fashion. Phase I renovations – which have already begun and are scheduled to be completed by July 1, 2009 – will entail the renovation and opening of a 6 bed inpatient facility. While this facility will serve to ensure a decreased maternal mortality rate in the region, inpatient services will also be used by patients with conditions as diverse as chronic lung disease, infection, or trauma. Phase II and Phase III renovations are scheduled to take place in 2010 and 2011 respectively, with the ultimate goal of a 15 bed inpatient facility, in addition to associated services including full outpatient and emergency care, surgical services, ultrasound and x-ray imaging, and a laboratory and pharmacy. In keeping with Nyaya’s philosophy that healthcare is a fundamental human right, services will remain free of cost to all patients.

Expansion of Bayalpata Inpatient services

<i>Item</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
Renovations/Equipment/Infrastructure	\$17,000	\$4,000	\$4,000
Maintenance/Depreciation	\$850	\$200	\$200
Human Resources	\$29,063	\$29,063	\$29,063
Pharmaceuticals	\$4,457	\$4,457	\$4,457
Consummable supplies	\$4,457	\$4,457	\$4,457
Total yearly cost	55,827	42,177	42,177

Timeline for the Roll-Out of Expanded Services			
Activity	2009	2010	2011
Community Dialogue and Mobilization	[Red bar spanning 2009, 2010, and 2011]		
Government negotiations	[Red bar spanning 2009]		
Site planning	[Red bar spanning 2009]		
Renovations	[Red bar spanning 2009]		
Expansion of community health network	[Red bar spanning 2009, 2010, and 2011]		
Enhanced primary care services	[Red bar spanning 2009, 2010, and 2011]		
Delivery Services	[Red bar spanning 2009, 2010, and 2011]		
Ultrasound	[Red bar spanning 2009, 2010, and 2011]		
X-Ray	[Red bar spanning 2009, 2010, and 2011]		
Inpatient Services	[Red bar spanning 2009, 2010, and 2011]		
Blood Transfusion	[Red bar spanning 2009, 2010, and 2011]		
Expanded Laboratory Services	[Red bar spanning 2009, 2010, and 2011]		
Surgical Services	[Red bar spanning 2009, 2010, and 2011]		
Fundraising Targets	\$226,059	\$177,701	\$174,381

Additional information can be found at:

Phase I renovations: http://blog.nyayahealth.org/2009/05/18/renovation_approach/

Bayalpata Expansion planning: http://www.nyayahealth.org/Library/Expansion_Planning.pdf

2) Expanding Nyaya Health's Teleradiology Program

Overview and Rationale

Approximately two-thirds of the world's population lacks access to diagnostic X-Ray services. Nyaya Health aims to develop a scaleable model for X-Ray that can reach the rural poor by utilizing its experience in Nepal to inform best practices in similar settings around the world. Digital x-ray, combined with teleradiology for complex cases and quality assurance, promises to meet the need by decreasing long-term operating costs, improving programmatic quality, and mitigating environmental and safety hazards. There are currently no X-Ray units in the district of Achham where Nyaya Health operates. We aim to create a model digital X-Ray program that can be scaled up throughout Nepal and South Asia, and serve as an instructive pilot system for governmental health ministries. The X-Ray program will build upon Nyaya's existing ultrasound program, which utilizes teleradiology for quality assurance purposes. While currently teleradiology services for our ultrasound program are strictly through Yale University, USA, Nyaya aims to develop collaborations within Nepal for future telemedicine services in a continued effort to expand capacity within the Nepali healthcare infrastructure.



Approach

Our digital x-ray program will proceed in two phases. The first phase is the deployment of a World Health Imaging System for Radiology (WHIS-RAD). We have negotiated discount pricing, installation, and training terms with the Spanish supplier SEDECAL for the system. Designed by the World Health Organization, the WHIS-RAD is largely considered the gold-standard x-ray system for rural resource-poor settings. The primary design characteristics include: 1) fixed tube column that is always centered on the cassette to guarantee minimal scatter radiation; 2) 11 kW battery system that can be charged even in extremely unstable electricity environments, charged by a typical 10 amp/220V wall outlet; 3) minimal moveable parts that minimize servicing needs and reduce the risk of malfunction; 4) high quality and safety largely independent of the operator; 5) owing to minimal scatter radiation risk, there are few additional site requirements; 6) x-ray tube ratings sufficient to reliably produce high-quality images. In the first phase, we will create analogue film images in a darkroom to be read on-site by our clinical team.



Following the first phase, Nyaya will incorporate a digital processor to the WHIS-RAD system. During the first 6-12 months of Phase 1, we will have established the essential clinical workflows to operate

our x-ray system effectively. The digital component will allow Nyaya to implement teleradiology services with collaborating institutions in the USA and within Nepal. The teleradiology process will require the ability to digitize all images, which will be obtained through the purchase of a digital cassette (which receives the x-ray beam) and a processor, which processes the image. The images can then be sent to collaborators who will advise on complex cases, as well as provide continual quality assurance. Nyaya's ongoing digital ultrasound program will provide a model for establishing this system.

Projected Capital and Operating Costs for Nyaya's Teleradiology Program

<i>Phase I</i>	<i>Item</i>	<i>July-November '09</i>
	WHIS-RAD Machine (Sedecal, Spain)	\$17750.
	Transportation of WHIS-RAD	\$2975.
	Installation and Training	\$3425.
	Film Processor (Carestream)	\$2000.
	Renovations of X-Ray Room and	\$1500.
	<i>Phase I Total</i>	\$27650.
<i>Phase II</i>		<i>February-July '10</i>
	Carestream Orex Digital Processor	\$20000.
	Workstation	\$1500.
	<i>Phase II Total</i>	\$21500.

Additional information can be found at:

Nyaya's teleradiology approach: http://blog.nyayahealth.org/2009/04/24/telemed_symposium/

Nyaya's Ultrasound program: <http://wiki.nyayahealth.org/UltrasoundProgram>

3) Rural Healthcare Delivery through Community Health Workers

Overview and Rationale

Through our experience caring for the community of Achham, we have learned the importance of supplementing our clinic-based work with a community-based outreach program. Many patients are carried to Nyaya's clinic by family members and neighbors on make-shift stretchers from anywhere between 1 and 8 hours away.

Often, the transfer process across the difficult terrain is so lengthy that patients become too ill to be helped by clinic staff upon arrival. Furthermore, the prevalence of chronic diseases requiring daily, long-term maintenance, such as HIV and tuberculosis, necessitate innovative mechanisms aimed at improving consistent care and attention to healthcare services in the community. For these reasons, building off of previous work in other settings, Nyaya Health has initiated a community health worker (CHW) program, both in the hopes of bringing better care to our own patients, and at the same time, further honing the CHW model for other similarly rural and impoverished communities in Nepal.



Approach

The CHW program trains locally identified community members to act as health advocates in their own villages. While CHWs often have little previous education, Nyaya provides CHWs with training to ensure monitoring and follow-up of illness in the community, empowering members of each village to become involved in the development of their own local healthcare system, and ensuring continued community input and feedback as Nyaya develops its programs. Equally important, CHWs are trained to provide basic medical services, including identification and referral of ill patients to Nyaya's central clinic, health

education, and provision of home-based care for chronic diseases. More specifically, CHWs provide the following services to their communities:

- referral of children for regular vaccination and/or ill persons to the clinic for proper treatment;
- follow-up of patients treated at the central clinic; this involves monitoring patients treated for serious conditions and encouraging follow-up at the clinic as required by the clinical team;
- monitoring of pregnant women, including distribution of vitamins and health education, and recruitment of patients to attend antenatal care visits at the clinic;
- detection and treatment of childhood malnutrition using an innovative combined clinic and community-based treatment model (wiki.nyayahealth.org/Malnutrition); and
- provision of treatment for chronic conditions including tuberculosis, Directly Observed



Treatment, Short-course (DOTS).

Each CHW is responsible for two village wards, comprised of approximately 1000 people, enabling Nyaya to deliver comprehensive care to patients living even in the most rural and remote areas. Over the past six months Nyaya has developed and revised our CHW model, including the necessary protocols for training, community-based follow-up, and the required data tracking, monitoring and evaluation systems integral to ensuring proper oversight of the program. In the 2009 and 2010 fiscal years, Nyaya plans to scale-up CHW services to cover an area with radius of 2 hours walking-distance from Bayalapata Hospital, which will oversee approximately 20,000 people.

Most recently, Nyaya has received a grant from the Strengthening Information and Communications Technology for Development Research Capacity in Asia Center (SIRCA) that will enable Nyaya to equip our CHWs with mobile technologies, in the form of mobile phones or palm pilots. These tools will increase efficacy of service delivery, enable clinical care in more remote villages while maintaining CHW contact with the clinic and other CHWs, and ultimately allow for expansion of our patient population. Through the continued development and expansion of our CHW model, Nyaya aims to ensure critical treatment, follow-up, and community-based accountability mechanisms to offer our patients an optimal standard of care, even in an extremely difficult and remote region.

CHW Program Expansion

<i>Item</i>	<i>2009</i>	<i>2010</i>
CHW Salaries (2500 NRPs/month)	\$3,750 (10 CHWs)	\$6,000 (16 CHWs)
CHW Coordinator (10,500 NRPs/month)	\$3,150 (2 coordinators)	\$3,150 (2 coordinators)
Training and personnel equipment	\$142.50	\$228.00
<i>Total yearly program costs</i>	<i>\$7,042.50</i>	<i>\$9,378.00</i>

*** *Mobile technologies, if implemented, will be subsidized through SIRCA funding*

Additional information can be found at:

CHW Logistics: <http://wiki.nyayahealth.org/CHWs>

SIRCA Grant Expansion: <http://blog.nyayahealth.org/2008/12/11/sirca/>

4) Powering Rural Healthcare – Nyaya’s Expansion of Energy Resources

Overview and Rationale

Healthcare delivery in such a rural setting requires a high-quality, reliable, clean, and sustainable energy supply. As a component of Nyaya’s efforts to develop a scalable model for healthcare delivery in similar settings, Nyaya aims to design an exportable model for electricity generation. Renewable energy technology in particular provides an opportunity to improve healthcare outcomes and enhance overall community development. Renewable energy can itself improve public health outcomes by decreasing carbon emissions and pollution. For rural populations who suffer from a lack of access to reliable traditional energy sources, solar energy is an important strategy for long-term economic and energy self-sufficiency. Finally, a reliable energy supply is essential for our growing clinical and telemedicine programs.

Approach

Nyaya will scale up energy resources for Bayalpata Hospital in a four-phased sequence over the coming 5 years. The approach itself will serve as a model for other rural healthcare facilities as they, like us, first meet their preliminary needs and then layer on additional energy capacity as services and associated energy requirements expand. A key aspect to the design of this model is the effective addition of new components while building upon previously purchased technologies.

In implementing new energy resources for Bayalpata Hospital, we will build upon our previous experience at our health center in providing sufficient and reliable power. The hospital is connected to the public electric grid, which is operational approximately 30% of the time owing to load-shedding and other regular power outages. As at the current clinic, for Phases I and II, our hospital will utilize a battery and inverter system to store energy and have a generator on-site



for backup power in emergency situations. In phases III and IV, as we start to generate solar power, we will sell excess solar electricity to the utility company or donate to our other educational and community activities. While impossible in Phases I and II, it is Nyaya’s aim to be self-reliant in our energy resources and to at the same time contribute to the power shortages of the local community in the long-term.

Energy Expansion Budget and Timeline

Phase 1: Transfer existing energy system to Bayalpata Hospital

Timeline for completion: July, 2009

Total project cost: \$1,425

Peak power off-grid: 4.5 KW

Storage capacity: 13 KWH

Phase 2: Preliminary expansion of energy capacity

Timeline for completion: December, 2009

Total cost: \$14,970

Peak power off-grid: 10.5 KW

Storage capacity: 39 KWH

Phase 3: Adding small-scale solar system
Timeline for completion: March, 2010
Total cost: \$48,737
Peak power off-grid: 15 KW
Storage capacity: 63 KWH
Solar capacity: 4.4 KW

Phase 4: Larger-scale energy capacity expansion
Timeline for completion: October, 2014
Total cost: \$213,914
Peak power off-grid: 31.5 KW
Storage capacity: 100 KWH
Solar capacity: 25.5 KW

Additional information can be found at:

Nyaya Energy Logistics: <http://nyayahealth.pbworks.com/Energy-Issues>

Nyaya's Energy Operations: http://blog.nyayahealth.org/2009/05/05/power_outages/

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