

## Health Needs Assessment in Impacted Populations

Surinder Kaul<sup>1,2</sup>, Pany Sananikhom<sup>2</sup>, Aeoudom Silavong<sup>2</sup> and Lattavanh Lattanavong<sup>2</sup>  
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(<sup>1</sup> International SOS, <sup>2</sup> Nam Theun 2 Power Company)

*NB: Please see costs for conducting the HC&S added to this paper at the end.*

Nam Theun 2 Hydroelectric Power Company (NTPC) is about to complete construction of a dam in central Laos to produce electricity, most of which will be exported to neighboring Thailand. The project is uniquely designed to combine the commercial enterprise with fully sustainable development opportunities to improve the lives of the Lao people, especially those living in the Project Area. The reservoir created by the dam will cover an area of 450 km<sup>2</sup> at full capacity, inundating sixteen villages (population~7000). These villages have been resettled into newly developed areas with quality housing, planed electrification, access roads, clean water and sanitation facilities. Community buildings like schools, health centers, markets and community halls are provided. Each household has been allocated a piece of land for agriculture and a separate area with rights of grazing.

### Introduction

Environmental and Health Impact Assessments are increasingly recognized as important prerequisites of large projects. Health Impact Assessment (HIA) is defined as a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population (WHO 1999). The Government of Laos has developed an HIA policy (MOH 2006) which was declared as a National Decree by the Prime Minister soon after its launch. Lao PDR is the first country in the region to have a separate national law/policy/decreed on HIA. The policy aims to contribute substantially to poverty alleviation and to the sustainability of development in Lao PDR, through the timely identification of adverse health effects of development and opportunities for health protection and promotion in the planning, design and operation of projects and programs and in the formulation and adjustment of development policies.

A detailed HIA was performed by NTPC prior to the start of the project. The Public Health Action Plan (PHAP) was part of this HIA (NTPC 2004b). Two large studies were also conducted in 2004 to obtain base line information for the Health Programs (Erlanger et al. 2008). Overall objective of the PHAP is to mitigate the effects of the dam construction and to *strengthen the existing government health infrastructure* in the project area for sustainability under the five areas of interventions:

1. Infrastructure, Equipment and Vehicles
2. Human Resource Development
3. Health Education and Awareness
4. Health Service Delivery Development
5. Surveillance and Monitoring

A small NTPC health team of four public health doctors, three Lao and one expatriate, facilitate the implementation of the PHAP through government health infrastructure.

The PHAP covers two Health Programs, the Resettlement and the Regional Health Programs. This paper is limited to one aspect of the Resettlement Health Program, which focuses on the Health Checks and Survey (HC&S), enabling the health center staff to provide comprehensive primary health care to the resettlers.

### **The Health Checks and Survey (HC&S)**

The concession agreement between Lao government and NTPC (NTPC 2005) requires an offer of a health check-up to all resettlers. This opportunity was extended to HC&S with the purpose of addressing health needs of the impacted population and to develop baseline information for future health monitoring and evaluation.

### **Government Health Infrastructure**

The resettlement villages are being served by government health workers through two well equipped Integrated Community Health Centers (ICHCs), built and equipped by NTPC. The fifteen bed district hospital (DH) serves as a referral point and is supported by the provincial hospital for tertiary care. The DH is provided with a four wheel drive and an ambulance by the project. All national health programs are implemented in the resettlement population through the two ICHCs and the DH. Each village has its own village health volunteer (VHV) and the traditional birth attendant (TBA). TBAs are provided with delivery kits and the VHVs with a drug cupboard, which is maintained by drug revolving fund managed by the district health services.

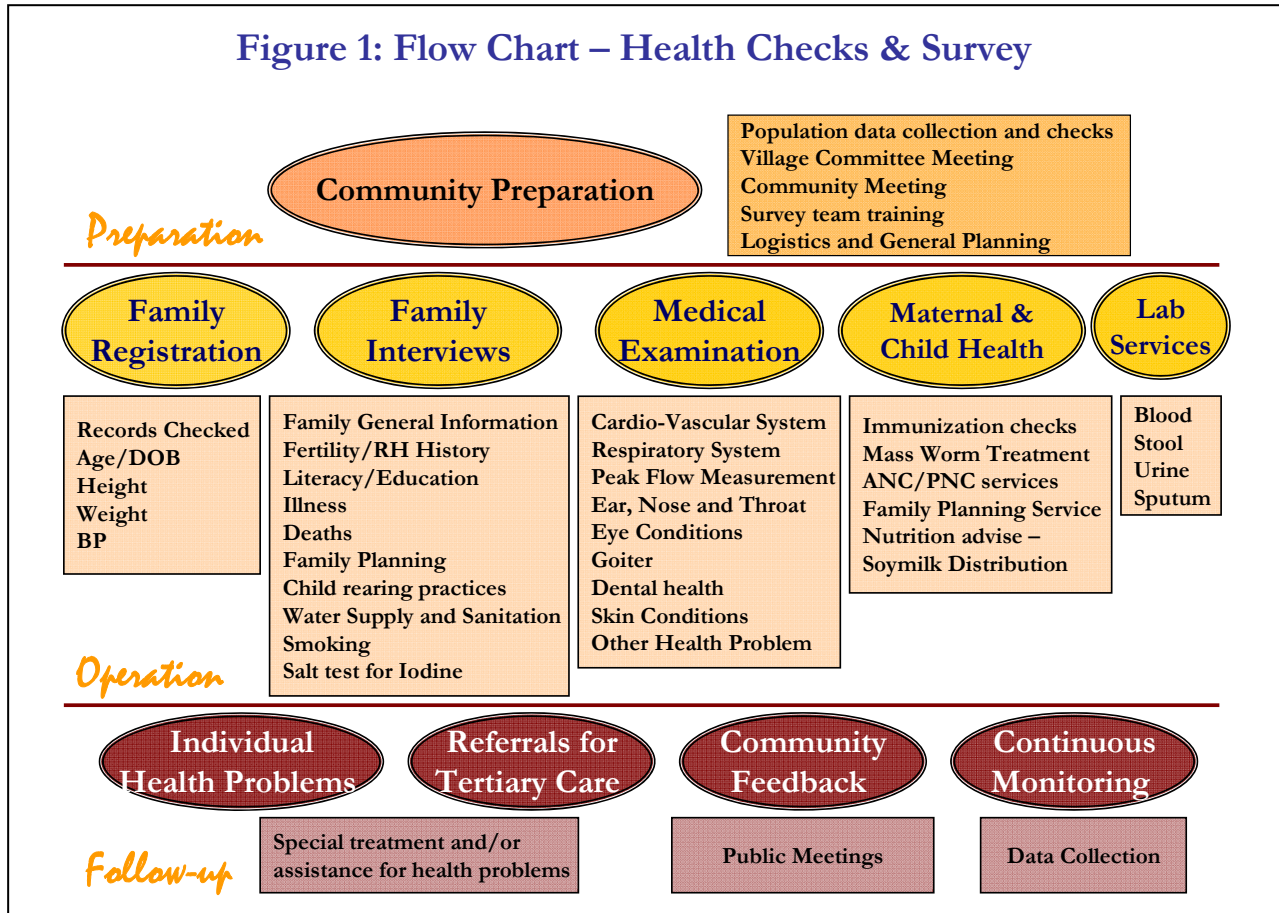
The HC&S, planned under the PHAP, was conducted in close collaboration with the impacted districts and provincial hospitals. The NTPC health team designed, planned and conducted the HC&S in collaboration with the district and provincial hospitals.

The objectives of the HC&S:

1. Developing a health profile of the resettled population
2. Identification of individuals with health problems and appropriate treatment
3. Meeting the Maternal and Child Health needs
4. Family Health Files for service provision and follow up
5. Continuous Monitoring of resettled population
6. Administration – listings of population subgroups for specific interventions
7. Community participation to encourage responsibility for personal health.

All HC&S were performed in the resettled villages. The national identity family booklets were used to compile HC&S lists for each village before the event. The questionnaire consistency was maintained with the previous baseline surveys for compatibility.

Figure 1: Flow Chart – Health Checks & Survey



Key to the illustration: DOB-date of birth, BP-blood pressure, RH-reproductive health, ANC-antenatal care, PNC-postnatal care.

## Methodology

Methodology consisted of three phases – preparation, operation and follow-up. Preparation and follow up phases are clear from the illustration (Figure 1).

## Social and Family history

In the operation phase, attendees were taken through five stations to fulfill the objectives of the HC&S.

At the **first** station, family was interviewed by NTPC health team, head of the family being the chief respondent. Registration details were checked and missing information completed. Additional information on full names of the family members, their relation to the head, date of birth and/or age and its verification, ability to read and/or write, educational attainment, occupation, marital status, reproductive health information from women, death in the family in the last year with cause, illness in the last two weeks, sanitary information and water supply and the type of drinking water used and bed net use at night was obtained.

## Height, Weight and Blood Pressure (BP)

The **second** station measured weight, height and BP, following standardized procedures. All adults were weighed on bathroom scales and children under five years were weighed on hanging

spring balance in a panty sling. Height was obtained by measuring against a measuring tape fixed to the tent steel poles or locally prepared wooden height meter. Children below age two were measured in recumbent position on locally designed length meter. BP for adults was measured using standard sphygmomanometer in sitting position.

### **Medical Examination**

At the **third** station, doctors conducted systemic medical examination for any debility and observations recorded on cardiovascular and respiratory systems; ear, nose and throat; palpable or visible enlarged thyroid gland; eye conditions; skin conditions; and general dental health. Any other abnormalities found were recorded and necessary referrals made to the district hospital.

### **Laboratory Tests**

The **fourth** station collected the urine and stool samples brought by the participants. Urine was tested for eight parameters on site with dip-sticks. Blood samples were collected by trained technicians, labeled, packed and dispatched in batches to the provincial/district hospital for analysis. Small children only provided a drop of blood for malaria slide and hematocrit.

### **Preventive Measures**

The **fifth** and the last station carried out a number of preventive measures namely immunizations for women and children, provision for family planning needs and mass anti-helminth treatment.

### **Data management**

The HC&S data was recorded on specially designed family sheets, coded, cleaned and computerized, followed by data analysis using SPSS®.

### **Preliminary results**

The HC&S in the first group of villages was well received with 84.3% attendance. Preliminary findings and ongoing monitoring of the resettled population show noticeable improvements since the start of the project. The population pyramid of resettled population shows declining numbers of under fives similar to the national trends. Childhood immunization rates have increased from 61.7% in 2005 to over 90% in 2008. Any parasite infestation rate in the population has declined from 80.6% to 43.0%. Further revelations from data analysis from sample surveys after the HC&S suggest that *mebendazole* is not as efficient in clearing the parasites and its replacement by *albendazole* in mass treatment has brought down parasitic infestations to lower than 10% (preliminary findings consistent with other studies [Keiser & Utzinger 2008]). The under five wasting in the first group of villages showed decline from 18.6% in 2006 to 6.1% in 2008. Mean hemoglobin values were higher in the pilot village (established-2003) for both men and women than in the rest of first group of villages analyzed (Pilot village-M:15.2% g/dlt and F:13.9% g/dlt; the rest M:13.1% gm/dl and F:12.4% gm/dlt). Full results of the HC&S are not available as yet, but results for first group villages analyzed are posted on the NTPC website (NTPC 2007).

### **Discussion**

The HC&S, as a requirement under the concession agreement challenged NTPC health team to make the best of this opportunity. The result was a unique methodology for health checks which provides more than a simple health checkup and equips the ICHC staff with a number of tools, enabling them to provide a comprehensive primary health care to the resettled population.

### **Family Health Files**

One of the by product of the HC&S was the population register which is used for preparing individual family files. The files are regularly updated with births and deaths and other important events in the family. The records are retained both with the VHV in the village and at the ICHC.

### **Population Health Profile**

Village population profiles were another benefit. With regular updates of this database, date of birth for under fives clinics is no longer a problem, as many parents did not remember the birth dates of their children. Statistical data such as deaths and birth rates, age and sex specific disease profiles, family planning needs, physical disability are some other examples. Continuous monitoring of the health profile will provide a monitoring tool to health care providers.

### **Individuals with health problems**

The relocated populations came from remote sites where access to health facilities, especially during rainy season, was impossible. A number of people were diagnosed with conditions, which if treated early, would have prevented disabilities; eye injuries being an example. Significant number of individuals were treated or referred for tertiary care.

### **Maternal and Child Health (MCH)**

The MCH being a priority under the PHAP, immunizations and growth monitoring of children, antenatal and postnatal care are carried out through monthly clinics in all resettled villages. In addition, acceptance of family planning and the optimum use of modern contraceptives is promoted and encouraged. The HC&S provided baseline data and enables full population coverage for these services.

### **Administrative and research purposes**

Computerized information collected from the HC&S enables the health workers to create listings for immunizations, growth monitoring of under fives, antenatal and postnatal cases, family planning needs and any other subgroup for specific interventions. Electronic data will also facilitate research and evaluation studies in the resettled population.

### **Health education programs**

Regular feedback to the villagers of HC&S results and continuous monitoring provides an excellent opportunity for health education and awareness. Analysis of data collected has identified reasons for ill health. Health education needs of mothers to supplement food for under fives and nutrition needs during pregnancy and lactation are examples. Targeted approach to high risk groups like smokers may be another use of the data.

### **Community participation**

Community participation during HC&S and the feedback subsequently, has made people understand their health problems and realization of their own responsibilities for health.

### **Conclusion**

The social development plan of NTPC (NTPC 2005b) has permitted the villagers to have improved well ventilated houses eliminating overcrowding, smoke free sleeping rooms, clean water and sanitation, all weather access to health facilities which have profound positive impact on the health of the people. The HC&S has significantly added to this improvement in health.

An opportunity exists for impacted populations where similar methodologies can be used for local health needs assessment and applying proven strategies to improve health of the people. It also provides an ideal opportunity for training health workers for the real health needs. This approach described here, we believe, is a starting point for a sustainable primary health care for this impacted population.

## References

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## **Additional information on Costs for conducting HC&S**

### **Costing**

The costs for conducting the health checks and survey (HC&S) came out of the public health budget. At every step measures were taken to be cost efficient without compromising standards. For example height measurement apparatus was locally manufactured and bathroom scales were used to measure weight of adults. Child hanging scales (spring balance) were used for weighing the children. All activities related to the HC&S were derived for the existing government health infrastructure. Both the manpower and the equipment were obtained from the district and provincial health offices. In addition to the NTPC health team, about 20 other staff members were assisted in conducting the HC&S. Preparation and training, actual health checks and laboratory testing for samples took on average ten days for one village. The period of health checks lasted from December 2005 to February 2008, just over two years.

<b>No.</b>	<b>Cost Category</b>	<b>Cost in US\$</b>	<b>As Percent</b>	<b>Cost/Person US\$</b>
1.	Per Deum	10,556	29.8	1.76
2.	Accommodation	1,577	4.4	0.26
3.	Travel	1,821	5.1	0.30
4.	Laboratory	15,681	44.2	2.61
5.	Administrative	5,862	16.6	0.98
	Total	35,497	100.0	5.92

Laboratory investigations carried out were as shown in the table below:

<b>No.</b>	<b>Sample</b>	<b>Number of samples tested</b>
1.	Blood smears for malaria parasite	5,679
2.	Blood for routine hematology	4,116
3.	Urine for dip stick 10 parameters	4,160
4.	Stool for intestinal parasite ova	4,093
	Total	18,048

Laboratory cost was the highest amounting to 44% of the total expenditure. Daily allowance for health workers amounted to 30% and another 16% was spent on administrative costs.