

EVALUATION OF COVERAGE OF DEWORMING INTERVENTIONS IN VIETNAM

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Abstract. In 2004-2005, the school deworming program in Vietnam targeted 2,400,000 school-children in 25 provinces. A questionnaire survey of a random sample of schools throughout the country was organized to validate the teacher feedback, assess the real coverage of the program and estimate the occurrence of side-effects. A total of 91 schools in four different provinces were visited few days after drug distribution. A total of 2,323 children and 80 teachers were questioned. The total cost of the monitoring has been estimated at US\$ 7,000 (less than 10% of the deworming program). The survey demonstrated a coverage of 95% for school-children and of 86.3% for teachers (on average a coverage 2% lower than the one reported by the teachers through forms on the day of drug administration). Approximately 0.4% of those interviewed reported side-effects after deworming, while the occurrence of side effects through routine reports was 0.15%. In both cases, the side effects were described as mild forms of nausea, abdominal pain, or headaches that did not require pharmacological treatment. The survey confirmed the positive results of routine reporting; we consider the survey a cost-effective activity to maintain the control activities under monitoring.

INTRODUCTION

In many tropical countries soil-transmitted helminths [STH: infections caused by *Ascaris lumbricoides* (roundworm), *Ancylostoma duodenale* and *Necator americanus* (hookworms) and *Trichuris trichiura* (whipworm)] are highly prevalent in the population due to climatic and hygienic conditions that are favorable for transmission (WHO, 2002).

Pre-school children, primary school children and women of childbearing age are the three groups most vulnerable to worm infections, since they are in a period of intense physical and/or intellectual growth (WHO, 2002).

Several studies have shown that worm

infections are associated with nutritional deficiencies, (iron-deficiency anemia, vitamin A deficiency and malabsorption) (Crompton and Nesheim, 2002) and adversely affect cognitive performance and susceptibility to infections (Stephenson *et al*, 1993; Stoltzfus *et al*, 2001).

Current strategies addressing morbidity are mainly based on regular mass distribution of anthelmintics, which is effective in reducing the level of morbidity (WHO, 2002).

The World Health Assembly (2001) set a global target for the control of this infectious disease (WHO, 2002) by the regular administration of chemotherapy to 75% of school-age children at risk of morbidity by 2010.

School-age children are an easy group to reach with drug-treatment and health education in countries where school enrolment rates are good (Partnership for Child Development, 1999). The low cost of a dose of mebendazole and the use of a well-established school infrastructure allows such a control-program to be affordable even in the least

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developed countries (Sinuon *et al*, 2005).

A recently published paper provides a review of several surveys of soil-transmitted helminths done in Vietnam between 1990 and 2001 (Van der Hock *et al*, 2003) estimating that 33.9 million people in Vietnam are infected with *Ascaris* (prevalence 44.4%), 17.6 million with *Trichuris* (prevalence 23.1%), and 21.8 million with hookworm (prevalence 28.6%). The prevalence of *Ascaris* and *Trichuris* infections showed a declining trend moving from the North to the South part of the country. These extremely high STH prevalences are probably due to the hot and humid climate, the use of untreated nightsoil in agriculture (Phuc *et al*, 2006) and the poor sanitation in rural areas.

Before the year 2000, only sporadic deworming campaigns had been carried out in Vietnam, mainly treating communities targeted for epidemiological surveys.

From 2000-2001, the Ministry of Health Vietnam (MoH) with WHO financial and technical support started a school based deworming program in 6 districts of 6 provinces in three different geographic regions, covering 120,000 primary school children. Three governmental health institutions headed the drug distribution. The National Institute for Malariaology, Parasitology and Entomology (NIMPE) for the North, the Institute of Malariaology, Parasitology and Entomology Qui Nhon (IMPE-QN) for the central region and the Institute of Malariaology, Parasitology and Entomology Ho Chi Minh City (IMPE-HCMC) was responsible for implementing activities in the South part of the country.

In 2002-2003 the project was extended to 39 districts in 11 provinces, covering 700,000 children. In 2004-2005 the program was expanded further to reach 2,400,000 children in 27 provinces.

The objectives of the survey presented were to: determine the level of treatment cov-

erage among school-children and to validate the teacher's feedback on coverage.

MATERIAL AND METHODS

The data collected from forms filled out by teachers during deworming days are summarized in Table 1. A questionnaire survey of a random sampling of schools throughout the country was organized to validate the deworming coverage.

The survey was carried out between December 2005 and February 2006. A total of 91 schools in 4 different provinces were visited at a mean of 10.35 days (0-78) after drug distribution. Two thousand three hundred twenty-three children and 80 teachers were questioned (Table 2). While sampling the country was divided into 3 different geographic regions (South, Central and North) by the regions already used for the campaigns. Within each region one or two provinces were randomly selected and within each province several schools were randomly chosen.

The process of sampling followed the method described by Bennett *et al* (1991), which allows even sampling with respect to different population sizes. The questionnaire was composed of 12 open- and close-ended questions evaluating if deworming occurred on the reported day, the coverage, the procedures adopted to treat absent children, the adequacy of drug received and the reasons for not having received treatment.

RESULTS

Coverage of drug treatment

The survey demonstrated a coverage of 95% for schoolchildren and 86.3% and 63% for teachers and teachers' families, respectively. One hundred seventeen children reported not having received deworming during the campaign. The reason for not receiving drug in 60 cases (52%) was they had received

Table 1
summary of the deworming activities as reported by teachers with reporting form filled out the day of drug distribution.

Indicator	Number
No. of target schoolchildren	2,759,603
No. of treatments provided to schoolchildren	2,710,570
Treatment coverage	98.20%
Time of distribution	December 2005-February 2006
No. of provinces covered	27
No. of districts covered	249
% of side-effects	0.15

Table 2
Localization of the sample of the survey.

	Northern region		Central region		Southern region	
	Bac Kan	Thai Nguyen	Da Nang	Quang Nam	Tay Ninh	Total
Surveyed districts	2	3	2	1	5	
Surveyed schools	19	34	7	6	25	91 (100%)
Type of school						
Main schools	19	21	7	6	17	70 (76.9%)
Sub-schools		13			8	21 (23.1%)
Location of school						
Rural	19	34		6	20	79 (86.8%)
City			7			7 (7.7%)
Urban					5	5 (5.5%)
Surveyed students	392	832	230	188	681	2,323

deworming within two weeks of the campaign; in 35 (30%) cases the reason was absence on the day of the campaign, in 19 cases the children were present but ill on the day of distribution and in 3 cases the child was fasting for religious reasons.

Sixty-six point seven percent of all main schools and 33.3% of all sub-schools arranged to store a limited amount of drug to treat children missing on the distribution day.

Side-effects

Side-effects of drug treatment were reported in 0.4% of cases and consisted of mild forms of vomiting, abdominal pain or headaches that did not require pharmacological

treatment.

DISCUSSION

The coverage data from the survey were on average 2% lower than the ones routinely reported by the teachers with forms the day of drug administration. This does not represent a big discrepancy, however, we believe it is essential to conduct surveys because it allows the managers to monitor the program by collecting first-hand detailed information about the reasons for not deworming, and helps to design methods to further increase coverage. It also allows them to directly discuss the activities with students and teachers, and to

evaluate their feeling toward the program and willingness to cooperate and helps to interpret the routinely collected data.

We consider the higher number of side effects estimated with the active survey (0.4%) compared to routine reporting (0.15%) as a normal discrepancy due to "active searching". Most of the side effects were mild and not frequently reported by the teachers.

We consider the cost of this monitoring survey (approximately US\$ 7,000, less than 10% of the total cost of the deworming campaign) a reasonable investment to maintain adequate monitoring of the project.

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