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Financial costs of deworming children in all primary schools in Cambodia

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Abstract

In 2002 Cambodia's Ministry of Health (MoH) launched a deworming programme to deliver an anthelmintic drug, (mebendazole 500 mg), and health education to 75% of its school children twice a year.

Cambodia's school population is approximately 2.8 million. The deworming programme was organized into two phases: the first phase (December 2002 - March 2003) targeted more than one million schoolchildren from 11 provinces and the second phase (July 2003 - January 2004) targeted the entire school population. The cost to treat each child was 12 cents of USD during the first phase, 6 cents during the second phase, and 3 cents for re-treatment in areas where the campaign was conducted for the second time.

The Cambodian experience demonstrates that with political commitment, high coverage for deworming is achievable even in a country with minimal resources. Cambodia's deworming programme represents a successful model for other developing countries.

Keywords

Deworming; Cambodia; school health; cost

Introduction

In 2001 the World Health Assembly set the “regular administration of chemotherapy to 75% of school-age children at risk of morbidity by 2010” as a target for the control of morbidity due to soil transmitted helminthiasis (STH) and schistosomiasis (WHO 2002). The global target was identified for several reasons. First, the disease burden caused by STH and schistosomiasis in children is considerably high around the world (Crompton 1999, Crompton & Nesheim 2002). Second, the low cost of the drug (i.e. 1000 tablets of generic anthelmintic cost less than 20 USD) allows the programme to be affordable even in the least developed countries (WHO 2002). Last, the drug administration is so simple and safe that school personnel can efficiently conduct it at very low cost. (Partnership for Child Development. 1999).

In 2002, Cambodia’s Ministry of Health (MoH) established the *National Task Force for the Control of Soil Transmitted Helminthiasis, Schistosomiasis and for the Elimination of Lymphatic Filariasis* (NTF¹), to achieve 75% coverage of schoolchildren. The NTF developed several documents and tools to facilitate the practical implementation of its activities: National Policy for Helminth Control, national guidelines and a school kit containing health education materials and standardized reporting forms.

According to the surveys conducted by the MoH’s National Center for Parasitology, Entomology and Malaria Control (NMC) for the last five years in 15 provinces (total sample over 6,600 schoolchildren), the prevalence of STH was consistently over 50% with large areas in which the prevalence was over 70% (NTF 2004). These estimates are similar to the prevalence estimates reported in published literature (Lee *et al* 2002, Sinoun *et al* 2003). To simplify logistic, the MoH of Cambodia chose to deworm twice a year the entire country, following WHO’s recommendations for areas of high prevalence (WHO 2002).

Material and Methods

Cambodia’s school children population is approximately 2,880,500 individuals. The net enrollment rate is 88% (UNESCO 2004). The total number of registered primary schools in Cambodia’s 24 provinces is 5,850. These schools are grouped into school clusters; each cluster is composed of 2 to 5 neighboring schools. There are 1,231 school cluster directors and 1,135 health center chiefs employed to manage the school clusters and health centers. All directors and chiefs attended training workshops—organized at the provincial level—on drug administration and health education. Each province conducted, on average, three, one-day workshops. The school cluster directors then disseminated workshop information to schoolteachers during regularly held weekly meetings.

¹The NTF is composed of staff from the Ministry of Health (including the National Malaria Center, National Institute of Public Health, departments of Communicable Diseases, Planning and Health Information, Drug and Food, Hospital Services, and Human Resources Development), the Ministry of Education, Youth and Sports, the Ministry of Rural Development, the Ministry of Water Resources and Meteorology, WHO and UNICEF.

Mebendazole—previously approved by the MoH to use in mass deworming campaigns and well known by Cambodian clinicians and public—was selected for its efficacy, safety and low cost.

The teachers did not receive monetary allowances for administering the mebendazole tablets to the school children but rather, as partial compensation, received tablets to treat him/herself and his/her family. The MoH financed drug procurement while the WHO and UNICEF financed training activities. The Embassy of Japan in Cambodia financed the development and printing of health education materials.

Drugs and materials for the deworming campaign were delivered to each peripheral health unit by the MoH's network of lorries used for its regularly scheduled deliveries. Once the mebendazole arrived to the health units, it was collected by each school cluster director who then distributed the appropriate number of tablets to each school.

During the country's first phase of treatment (December 2002 - March 2003), more than one million schoolchildren from 11 provinces were targeted to receive mebendazole (500 mg) and health education. In the country's second phase of treatment (July 2003 and January 2004), all the school children were targeted.

NMC monitored the programme coverage in two ways: with standardized forms and with coverage confirmation surveys. Teachers filled in forms during deworming days. Data from these forms were summarized and transmitted between cluster, district and provincial levels. To validate coverage, the NMC conducted a confirmation survey in a random sample of 36 schools in 5 districts for the first phase and 81 schools in 27 districts for the second phase.

Results

The school forms containing information about the drug distribution were returned to the Cluster director and then passed to the MoH, this system was considered a valid low-cost option, however, in some cases the forms reached the NMC well over the 6 months initially planned as a deadline. This delay made impossible a complete evaluation of the programme results before the successive drug distribution.

In total, the MNC received back from the school 5,825 forms accounting for a treatment of 2,774,564 schoolchildren and 65,482 teachers and teacher relatives. According to the forms received, during the first phase, 90% of the children enrolled in the 12 targeted provinces was treated and during the second phase over 95% of the enrolled children was treated. The results of the confirmation survey indicated that programme coverage in the sample was not statistically different from the coverage reported from the teachers' reports in the same sample.

Financial costs of the programme (training, drug procurement, printing of health education materials, etc.) are presented in Table 1. Indirect costs (time lost from work by directors during dissemination of information in schools and by teachers administering drugs and health education in classes) were claimed by the Ministry of Education as a cost-effective contribution to the improvement of the children's school performances. These activities were

conducted during “school working hours” and covered by the regular salary of the school personnel.

Table 1 show that the cost for each treated child was 12 cents in the first phase of the campaign and 6 cents second phase. The cost for re-treating children in areas where the campaign was conducted for the second time was 3 cents. The reduced costs were due to the fact that cluster directors— who participated in the first phase— were not trained during the second phase.

Taking into account the net enrolment rate of 88% (UNESCO 2004) the coverage of school-age children in the second phase of the campaign is estimated at 84%.

From 2004 onward, Cambodia’s deworming campaigns will be repeated every 6-months at an estimated cost of 4 cents per child. This estimation includes the cost of re-printing health education materials (expected to last for at least 5 years) and re-training of the teachers (every 3 years). The only annually reoccurring expenses will be the mebendazole and monitoring activities.

Discussion

The financial costs for this national campaign are similar to the costs estimated by the Partnership for Child Development (1999) in small-scale experiences in African setting.

According to the UNDP Human Development Report (2003), Cambodia ranks 130th out of 175 countries on the human development index. Despite this low ranking and because decision makers are strongly committed Cambodia was able to reach over 2 million children with deworming. Following this intervention Cambodian school children are expected to achieve immediate benefits such as improvements in nutritional status, school attendance and school performance. The experience in Cambodia demonstrates that with political commitment, the WHO global target of covering 75% of the school aged population with regular deworming for the control of soil transmitted helminthiasis is achievable even in situation of minimal resources. The programme represents a successful model for other developing countries.

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Table 1

Financial costs of the first two rounds of the school deworming campaigns in Cambodia.

Campaign details	Date	April 2003		February 2004	
	Geographical Target	11 provinces		Entire country	
	Population target	1,050,000 schoolchildren		2,880,450 schoolchildren	
	Coverage	90% (945,000 children)		96% (2,774,564 children)	
		Description	USD	Description	USD
Training *	School Cluster Director training	39 one-day training sessions. Total number of participants: 1,457	24,969	29 one-day training sessions Total number of participants: 909	17,462
	Teacher training	Conducted during regular weekly meetings	-	Conducted during regular weekly meetings	-
Drug **	Mebendazole 500 mg	1,155,000 tablets (0,0215 USD / tablet)	24,832	3,102,000 tablets (0,0215 USD/tablet)	66,693
	Distribution to schools	Through the MoH trucks	-	Through the MoH trucks	-
	Administration to schoolchildren	By teacher	-	By teacher	-
Health Education material *	Development/update	By National Malaria Center /MoH personnel	-	By National Malaria Center /MoH personnel	-
	Printing HE	4,000 sets	69,168	2,400 sets ***	69,696
	Distribution	Distributed during the training	-	Distributed during the coverage survey	
Monitoring *	Routine monitoring	Forms routinely filled and summarized	-	Forms routinely filled and summarized	-
	Coverage survey in a sample of schools		-		5,000
Total Cost			118,969		158,851
Drug cost per treated child			0.026		0.024
Delivery cost per treated child			0.096		0.033
Total cost per treated child			0.122		0.057

* Cost to be sustained every 5 years

** Recurrent costs

*** During the second distribution a renovated set of health Education material has been distributed (the cost for each set increased from 17 USD to 29 USD)