Policy and Practice

Treatment in Kenyan rural health facilities: projected drug costs using the WHO–UNICEF integrated management of childhood illness (IMCI) guidelines*

L.L. Boulanger,[1] L.A. Lee,[2] & A. Odhacha[3]

Guidelines for the integrated management of childhood illness (IMCI) in peripheral health facilities have been developed by WHO and UNICEF to improve the recognition and treatment of common causes of childhood death. To evaluate the impact of the guidelines on treatment costs, we compared the cost of drugs actually prescribed to a sample of 747 sick children aged 2–59 months in rural health facilities in western Kenya with the cost of drugs had the children been managed using the IMCI guidelines.

The average cost of drugs actually prescribed per child was US$ 0.44 (1996 US$). Antibiotics were the most costly component, with phenoxymethylpenicillin syrup accounting for 59% of the cost of all the drugs prescribed. Of the 295 prescriptions for phenoxymethylpenicillin syrup, 223 (76%) were for treatment of colds or cough. The cost of drugs that would have been prescribed had the same children been managed with the IMCI guidelines ranged from US$ 0.16 per patient (based on a formulary of larger-dose tablets and a home remedy for cough) to US$ 0.39 per patient (based on a formulary of syrups or paediatric-dose tablets and a commercial cough preparation).

Treatment of coughs and colds with antibiotics is not recommended in the Kenyan or in the IMCI guidelines. Compliance with existing treatment guidelines for the management of acute respiratory infections would have halved the cost of the drugs prescribed. The estimated cost of the drugs needed to treat children using the IMCI guidelines was less than the cost of the drugs actually prescribed, but varied considerably depending on the dosage forms and whether a commercial cough preparation was used.

Keywords: child health services; costs and cost analysis, drug costs; delivery of health care, integrated; rural health services.

Voir page 857 le résumé en français. En la página 858 figura un resumen en español.

Introduction

To improve the recognition and treatment of the most common causes of childhood mortality in developing countries, WHO and UNICEF have developed guidelines for the integrated management of childhood illness (IMCI) in first-level health facilities. The guidelines describe the stepwise assessment, classification, treatment, counselling, and referral of sick children. In contrast to previous guidelines for the management of a single-disease condition, such as childhood diarrhoea and acute respiratory infections, health workers use the IMCI guidelines to assess all sick children for general danger signs, acute respiratory tract infections, diarrhoea, malaria, measles, ear infections, anaemia, and malnutrition. Illnesses are classified based on the presence or absence of simple clinical signs and symptoms, and these classifications are linked to specific treatments which recommend inexpensive drugs of known efficacy. A recent study in western Kenya found that health workers using the guidelines could identify correctly over 90% of the cases of pneumonia, malaria, malnutrition, and anaemia that had been diagnosed by an expert paediatrician supported by haemoglobin determination, blood smear examination, and chest X-rays (*1*).

* Correspondence and requests for reprints should be sent to Michael Deming, International Child Survival and Emerging Infections Program Support Activity, Mailstop F22, Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA 30333, USA.

¹ Division of Applied Public Health Training, Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, GA, USA.

² International Child Survival and Emerging Infections Program Support Activity, Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA.

³ Ministry of Health, Nairobi, Kenya.

Ref. No. **0061**

Use of the IMCI guidelines may increase drug treatment costs if it results in the identification of a greater number of illnesses requiring treatment, or in the identification of a greater number of illnesses requiring treatment with more expensive drugs. Conversely, use of the guidelines may decrease drug treatment costs if it reduces inappropriate drug prescriptions or leads to the use of less expensive drugs. To determine the potential impact of using the IMCI guidelines on treatment costs, we calculated the cost of drugs prescribed to a sample of sick children in rural health facilities in two districts of Western Province, Kenya, prior to the introduction of the IMCI guidelines. Subsequently we estimated the cost of drugs that would have been prescribed had the same children been managed in accordance with national treatment policies at the time of the study, and the cost of the drugs had they been treated using the IMCI guidelines.

Materials and methods

The study was conducted in all the rural health facilities in Vihiga district (population: 600 000) and Bungoma district (population: 880 000) in Western Province, Kenya. Malaria, diarrhoea, pneumonia, and malnutrition are endemic in the region, and the infant and under-5-year-old mortality rates have been estimated to be 63.5 and 109.6 deaths per 1000 live births, respectively (2). An estimated 95% of women in Western Province live within 10 km of a rural health facility (2), which is the most peripheral government health facility in Kenya. Drugs used in rural health facilities are supplied by the Kenya Essential Drugs Programme in the form of kits, each expected to treat 2000–3000 episodes of illness (3). According to national policy, the child health services and essential drugs for sick children under 5 years of age are provided free of charge, but most health facilities impose a small fixed fee per child if the child receives a drug. Drugs that are prescribed but not in stock can be purchased by the families at private pharmacies.

To obtain information on a representative sample of patient consultations, each of the 36 rural health facilities in the two districts was visited on one randomly selected weekday between 26 July and 5 August 1994 by one of four survey teams. All sick children aged 2–59 months who were seen at the health facility on the day it was visited were eligible for inclusion in the survey. The teams observed all consultations with patients in this age group and, at the end of each consultation, recorded the illnesses diagnosed by the health worker. Before the child left the facility, the carer was interviewed and information from the prescription was abstracted. The child was then re-examined by a clinical officer using the IMCI guidelines, and the diagnoses and recommended treatment were identified.

The IMCI guidelines had not been introduced at the time of the study, so we calculated the cost of treating the illnesses identified by the IMCI examination according to (i) the national recommendations at the time of the study, and (ii) the treatment recommendations in the generic version of the IMCI guidelines (4). Cost estimates for national treatment recommendations in effect in 1994 were based on use of procaine penicillin for the treatment of pneumonia and chloroquine for the treatment of malaria. Consistent with current national guidelines, estimates of the cost of drugs recommended when using the IMCI guidelines were based on treatment of malaria and pneumonia with sulfadoxine–pyrimethamine and co-trimoxazole, respectively (5–7). Because a single drug may be listed in more than one dosage form in the IMCI treatment guidelines, we calculated a low-cost estimate based on the use of the largest-dose tablets recommended and a home remedy for children with cough or cold, and a high-cost estimate based on the use of syrup dosage forms, or the smallest-dose tablets if the drug was not available as a syrup, and a commercial cough preparation.

The cost of drugs was calculated by multiplying the number of units of each drug prescribed by the unit cost of that drug as listed by the International Dispensary Association (IDA) in the *International drug price indicator guide* for 1996 (8), which was the most recent edition available. IDA is an international nonprofit agency that procured and supplied essential drugs to the Kenya Essential Drugs Programme at the time of the study. Drugs were categorized as antibiotics, antimalarials, antipyretics, iron and vitamins, cough syrup, oral rehydration salts, and other drugs. Drugs prescribed by health workers to treat illnesses not specifically covered in the IMCI guidelines, such as diazepam for convulsions or hydrocortisone ointment for rash, were grouped under "other". The amount and cost of each of the "other" drugs were assumed to be the same for all estimates. The cost of a commercial cough preparation was based on a 40-ml treatment course of Histatussin[R] (Carlisle Laboratories Ltd, Bridgetown, Barbados), which is the only cough preparation listed in the 1996 drug price indicator guide. Treatment costs did not include the cost of drug delivery, needles, syringes, re-packaging, or indirect costs.

Results

A total of 747 (99%) sick children, out of the 757 who were eligible for inclusion in the survey, participated; two-thirds of these children were under 2 years of age. The five most common presenting complaints were fever, cough, vomiting, diarrhoea, and not eating. The health workers identified a total of 1335 illnesses (average: 1.8 per child), with the most common being malaria (562 children, 75%) and cough or cold (413 children, 55%) (Table 1). Based on the results of the examinations using the IMCI guidelines, a total of 2068 illnesses (average: 2.8 per child) were identified, 1291 (62%) of which were malaria, cough or cold, and anaemia. The higher

Table 1. **Frequency of selected illnesses among 747 sick children aged 2–59 months in rural health facilities in Vihiga and Bungoma districts, Kenya, identified by health workers and clinical officers using the integrated management of childhood illness (IMCI) guidelines, 1994**

Illness condition	No. identified by health workers	No. identified by clinical officers using the IMCI guidelines
Malaria	562	655
Cold or cough	413	299
Diarrhoea	41	176
Pneumonia	39	247
Anaemia	14	337
Dysentery	3	16
Other	263	338
Total	1335	2068

number of illnesses identified using the IMCI guidelines was mainly due to the detection of more children with anaemia, pneumonia, or diarrhoea.

The amounts and cost of the drugs actually prescribed by health workers are shown in Table 2. The total cost of the drugs prescribed was US$ 329.88 (average: US$ 0.44 per child). Antibiotics were the most costly drug category, and accounted for US$ 254.34 (77%) of the total drug cost. Phenoxymethylpenicillin syrup was the drug prescribed in largest amounts, and accounted for 59% of the total drug costs. In all, 295 (39%) of the 747 children received a prescription for phenoxymethylpenicillin syrup; 223 (76%) of these prescriptions were for children diagnosed with a cough or cold. Treatment for illnesses not explicitly covered by the IMCI guidelines, such as rash, accounted for US$ 20.95 (6%) of the total drug cost.

Table 3 shows the estimated costs of treating the IMCI-diagnosed illnesses according to national treatment policies that were in effect in 1994 (US$ 169.12; average, US$ 0.23 per patient), and the low-cost and high-cost estimates of treating the same illnesses according to the recommendations in the generic version of the IMCI guidelines. The difference in the cost of the drugs actually prescribed and the cost of the drugs that would have been prescribed according to national treatment policies was mainly due to the absence of phenoxymethyl-penicillin syrup in the latter, since this drug is not recommended nationally for treatment of acute respiratory infections. The low-cost estimate of the drugs recommended in the IMCI guidelines, based on larger-dose tablets and a home remedy for cough, was US$ 116.23 (average, US$ 0.16 per patient). Oral rehydration salts and antibiotics accounted for US$ 32.82 (28%) and US$ 28.72 (25%) of the total cost, respectively. The high-cost estimate of the drugs recommended for use by the IMCI guidelines, based on drugs in syrup form when possible, or smaller-dose tablets, and a commercial cough syrup,

was US$ 289.28 (average, US$ 0.39 per patient). Co-trimoxazole syrup and cough syrup accounted for 48% and 31% of the total drug cost, respectively, in the high-cost estimate.

The average costs of the drugs actually prescribed and of those that should have been prescribed per patient are shown by drug category in Fig. 1. The difference between the low-cost and high-cost estimates is mainly due to the higher cost of a course of co-trimoxazole, iron and paracetamol in syrup form versus tablet dosage form, and the additional cost of using a commercial cough preparation instead of a home remedy to relieve cough and soothe the throat. The totals of the low-cost and high-cost IMCI estimates, although treating nearly twice the number of illnesses, were both less than the cost of the drugs that were actually prescribed.

Discussion

It appears from this study that the use of the IMCI guidelines would help identify a greater number of illnesses requiring treatment; the cost of treating these additional illnesses, however, is low. Anaemia and pneumonia accounted for the majority of the additional illnesses identified. If the IMCI guidelines are used, a child with anaemia in an area where the risk of malaria is high would be treated with an oral antimalarial, iron, as well as mebendazole if the child is over 2 years of age and had not received an anthelminthic in the previous 6 months. Since most of the children in this study had a febrile illness which met the criteria for malaria, the only additional drug costs incurred would be a course of iron to treat the anaemia, and possibly mebendazole; both of these drugs are relatively inexpensive. The cost of treating a case of pneumonia varied considerably, depending on the dosage formulation of the antibiotic used, and whether a commercial cough preparation was used instead of a home remedy. The individual cost of a 5-day course of co-trimoxazole syrup and a commercial cough preparation ranged from US$ 0.27 to US$ 0.42, depending on the age of the child. In comparison, the cost of a 5-day course of co-trimoxazole, based on adult-dose tablets, and no commercial cough preparation ranged from US$ 0.06 to US$ 0.11 per patient.

We found that phenoxymethylpenicillin syrup accounted for over half the cost of the drugs prescribed for treating childhood illnesses in the rural health facilities. The majority of these prescriptions for phenoxymethylpenicillin syrup were for treatment of cough or cold, and thus inappropriate; in fact, health workers in the facilities surveyed commonly described it as "cough syrup". While use of antibiotics for the treatment of cough and cold is discouraged by the Kenyan Ministry of Health (7), the drug information sheets that are issued with the essential drugs kit include respiratory infections as one of the indications for prescribing phenoxy-

Table 2. **Amount and costs of all drugs prescribed by health workers to treat 747 sick children aged 2–59 months in rural health facilities in Vihiga and Bungoma districts, Kenya, 1994**

Drug category	Drug dosage form	Amount prescribed	Cost (in 1996 US$)
Antibiotics	Phenoxymethylpenicillin, 25 mg/ml syrup	32 039 ml	195.44
	Procaine penicillin, 400 000 units/ml injection	899 ml	26.88
	Benzylpenicillin, 500 000 units/ml injection	419 ml	23.63
	Co-trimoxazole, 200 x 40 mg/5 ml syrup	845 ml	4.82
	Phenoxymethylpenicillin, 250 mg tablet	154 tablets	2.48
	Co-trimoxazole, 400 x 80 mg tablet	100 tablets	1.09
	Subtotal		*254.34*
Antimalarials	Chloroquine phosphate, 10 mg/ml syrup	11 062 ml	21.02
	Chloroquine phosphate, 50 mg/ml injection	445 ml	7.03
	Chloroquine phosphate, 150 mg tablet	265 tablets	2.28
	Quinine sulfate, 200 mg tablet	51 tablets	1.64
	Quinine dihydrochloride, 300 mg/ml injection	9 ml	0.78
	Amodiaquine, 200 mg tablet	3 tablets	0.07
	Subtotal		*32.82*
Oral rehydration solution	1 litre packet	111 packets	*8.74*
Anthelminthics	Mebendazole, 100 mg tablet	284 tablets	1.90
	Levamisole, 50 mg tablet	39 tablets	0.21
	Subtotal		*2.11*
Iron	Iron (II) salt, 20 mg iron/ml syrup	284 ml	0.44
	Iron (II) salt, 60 mg iron tablet	49 tablets	0.08
	Subtotal		*0.52*
Antipyretics	Paracetamol, 500 mg tablet	2666 tablets	9.60
	Paracetamol, 24 mg/ml syrup	242 ml	0.73
	Acetylsalicylic acid, 300 mg tablet	33 tablets	0.07
	Subtotal		*10.40*
Other drugs	Chlorpheniramine, metronidazole, gentian violet, folic acid, vitamins, diazepam, diphenhydramine, and topical ointments		20.95
Total cost (US$)			**329.88**
Average cost per patient (US$)			**0.44**

methylpenicillin syrup (9). The latter is not recommended for the treatment of any illnesses explicitly covered by the IMCI guidelines, and in view of the limited indications for its use, the high cost, and the degree with which it is misused, consideration should be given to removing it from the essential drugs kit provided to the rural health facilities. The advantages and disadvantages of replacing phenoxymethylpenicillin syrup with an appropriate, pre-packaged cough syrup should be carefully considered. While providing a commercial cough syrup would greatly increase the total drug costs, failure to provide an appropriate substitute may have unintended negative effects, such as increased inappropriate use of co-trimoxazole syrup for treating colds or cough. In the USA, withholding Medicaid payment for selected drugs of questionable efficacy was followed by a dramatic decline in the rate they were prescribed (10). However, this decrease was more than offset by an increase in the rate of prescription of substitute drugs, many of which were judged to result in an uncertain or unlikely improvement in treatment.

The total cost of the drugs needed to treat the illnesses identified using the IMCI guidelines in our low-cost estimate was less than half that of our high-cost estimate. While a treatment course based on larger-dose tablets is less expensive than a course of the same drug as a smaller-dose tablet or in syrup dosage form, splitting of larger tablets is not always easy and could result in inaccurate doses if the tablets are not scored. In any case, the compliance of young children is significantly lower with tablets than with syrups. In a study of children with pneumonia treated with different formulations of co-trimoxazole, 82% of children who received the syrup were still taking it on the fourth day of the illness, compared with only 55% of those who received co-trimoxazole tablets (11).
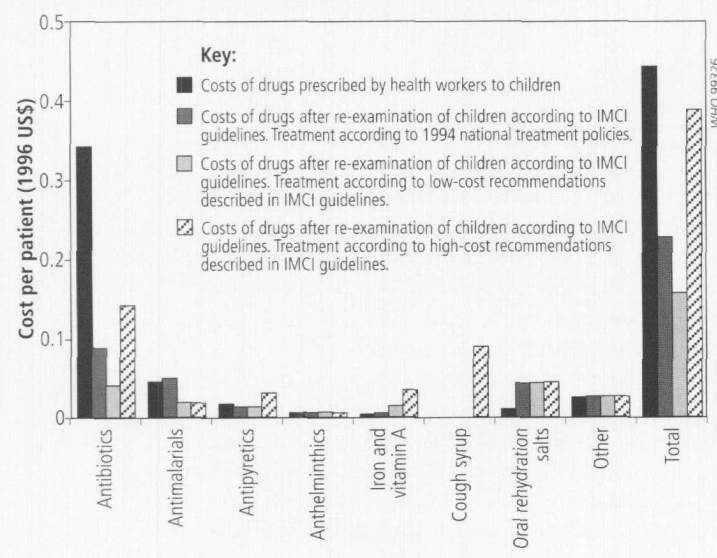
This study in the application of IMCI guidelines has provided useful information on drug costs,

Table 3. Estimated amount and costs of drugs needed to treat 747 sick children, aged 2–59 months, in rural health facilities using the IMCI guidelines, Vihiga and Bungoma districts, Kenya, 1994

1994 national recommendations			IMCI low-cost recommendations			IMCI high-cost recommendations		
Antibiotics								
Benzylpenicillin, 500 000 units/ml inj	63 ml	3.55	Chloramphenicol, 1000 mg/vial	28 620 mg	6.87	Chloramphenicol, 1000 mg/vial	28 620mg	6.87
Procaine penicillin, 400 000 units/ml inj	2005 ml	59.95	Co-trimoxazole, 400 x 80 mg tablet	2005 tablets	21.85	Co-trimoxazole, 200 x 40 mg/5 ml syrup	17 125 ml	97.61
Co-trimoxazole, 400 x 80 mg tablet	140 tablets	1.53						
Antimalarials								
Chloroquine phosphate 50 mg/ml inj	185 ml	2.92	Quinine dihydrochloride, 300 mg/ml inj	7 ml	0.61	Quinine dihydrochloride, 300 mg/ml inj	7 ml	0.61
Chloroquine phosphate 10 mg/ml syrup	15 205 ml	28.89	Sulfadoxine–pyrimethamine, 500 x 25 mg tablet	353 tablets	11.75	Sulfadoxine–pyrimethamine, 500 x 25 mg tablet	353 tablets	11.75
Chloroquine phosphate 150 mg tablet	501 tablets	4.31						
Oral rehydration salts								
1 litre packet	417 packets	32.82	1 litre packet	417 packets	32.82	1 litre packet	417 packets	32.82
Anthelminthics								
Mebendazole, 100 mg tablet	495 tablets	3.32	Mebendazole, 100 mg tablet	495 tablets	3.32	Mebendazole, 100 mg tablet	495 tablets	3.32
Vitamins and minerals								
Iron(II) salt, 60 mg tablet	1407 tablets	2.25	Iron (II) salt, 60 mg tablet	1407 tablets	2.25	Iron (II) salt, 20 mg/ml syrup	8281 ml	24.01
Vitamin A, 100 000 units tablet	3 tablets	0.08	Iron (II) salt, 20 mg/ml syrup	2282 ml	6.62	Vitamin A, 50 000 units tablet	73 tablets	1.07
			Vitamin A, 200 000 units tablet	23 tablets	0.60			
			Vitamin A, 50 000 units tablet	3 tablets	0.04			
Antipyretics								
Paracetamol, 500 mg tablet	2376 tablets	8.55	Paracetamol, 500 mg tablet	2 376 tablets	8.55	Paracetamol, 100 mg tablet	8682 tablets	22.57
Cough remedy								
Home remedy to soothe the throat		no cost	Home remedy to soothe the throat		no cost	Commercial cough syrup	21 840 ml	67.70
Other drugs[a]		20.95	Other drugs[a]		20.95	Other drugs[a]		20.95
Total cost (US$)		**169.12**			**116.23**			**289.28**
Average cost per patient (US$)		**0.23**			**0.16**			**0.39**

[a] Includes piriton, metronidazole, gentian violet, folic acid, multivitamins, diazepam, diphenhydramine, topical benzyl benzoate, benzoic and salicyclic acids, and hydrocortisone.

Fig. 1. Costs of drugs to treat 747 sick children in rural health facilities in Vihiga and Bungoma districts, Kenya, 1994

Key:
- Costs of drugs prescribed by health workers to children
- Costs of drugs after re-examination of children according to IMCI guidelines. Treatment according to 1994 national treatment policies.
- Costs of drugs after re-examination of children according to IMCI guidelines. Treatment according to low-cost recommendations described in IMCI guidelines.
- Costs of drugs after re-examination of children according to IMCI guidelines. Treatment according to high-cost recommendations described in IMCI guidelines.

WHO 99326

but there were several limitations. The projected costs were based on the assumption that the sick children received optimal management, that inappropriate drugs would not be given, and use of the exit examination findings as the standard for comparison. In practice, health workers are unlikely to identify correctly all the illnesses and to stop prescribing inappropriate drugs. It would therefore be useful to repeat this study in a variety of settings to determine the effect of the IMCI guidelines on actual treatment costs after the guidelines have been implemented. Because we wanted to approximate as closely as possible the costs that would be actually incurred for drug procurement in Kenya, we based our cost estimates on the IDA price list, this international agency being responsible for supplying the essential drugs kits at the time of our study. The cost of drugs, however, varies with the supplier so that our estimates could change with a different supplier. The use of a commercial cough preparation instead of a home remedy also increased the cost of the drugs given to the children in our survey. We based the cost of a commercial cough preparation on the one cough preparation listed in the *International drug price indicator guide*; other commercial cough preparations may be less expensive. However, drugs in syrup dosage form tend to be more expensive, regardless of the active ingredient, because of the packaging and storage requirements, limited shelf-life, and the added cost of the syrup base. Estimation of indirect costs was beyond the scope of this study, so that our estimates covered only the costs of the drugs alone. Indirect costs, such as opportunity and transport costs for repeated health facility visits to complete a course of antibiotics by injection, or the

costs to the carers of providing a home remedy to soothe the throat and relieve cough, were not included, but may be considerable.

Our study shows that substantial cost savings could be achieved by reducing inappropriate drug prescriptions through adherence to existing national treatment guidelines, particularly in eliminating the use of phenoxymethylpenicillin syrup to treat cough and cold. The contents of an essential drugs kit and package instructions should be consistent with national treatment policies, and more effort is needed to ensure that all health workers in rural health facilities clearly understand the indications for each drug provided. Although use of the IMCI guidelines identified nearly twice as many illnesses as the number previously diagnosed by the health workers, even our high-cost estimate of drugs resulting from optimal use of these guidelines was less than the cost of the drugs actually prescribed. The total drug costs varied considerably with the choice of drug dosage form. While a treatment course based on the use of larger-dose tablets is generally much less expensive than a course using the syrup formulation or smaller-dose tablets, the choice of drug dosage forms must also take into account the ease of administration and the expected compliance by patients. Given the large numbers of sick children presenting with cough and the current practice of using phenoxymethylpenicillin syrup as a cough syrup, further study is needed to determine whether removing this antibiotic syrup from the essential drugs kit and recommending that carers prepare a home remedy to soothe the throat and relieve the cough would be more cost-effective than replacing phenoxymethylpenicillin syrup with an appropriate, pre-packaged cough syrup in the drugs kit. ■

Acknowledgements

Résumé

Traitement dans un centre sanitaire rural au Kenya : coûts projetés des produits pharmaceutiques calculés conformément aux directives OMS/UNICEF pour la prise en charge intégrée des maladies de l'enfant (PCIME)

L'OMS et l'UNICEF ont élaboré des directives pour la prise en charge intégrée des maladies de l'enfant (PCIME) dans le but d'améliorer le diagnostic et le traitement des causes courantes de décès. Pour voir dans quelle mesure ces directives peuvent avoir un effet sur le coût du traitement, nous avons comparé le coût des médicaments effectivement prescrits à un échantillon d'enfants malades de 2 à 59 mois dans des centres de santé ruraux appartenant à deux districts de l'ouest du Kenya, au coût des médicaments qui leur auraient été prescrits s'ils avaient été pris en charge selon les directives de la PCIME.

Comme un médicament peut exister sous plusieurs formes galéniques, nous avons retenu i) une hypothèse basse correspondant à l'utilisation des doses les plus élevées des comprimés recommandés plus un remède familial pour soigner le rhume ou la toux des enfants et ii) une hypothèse haute correspondant à l'utilisation de sirops ou de comprimés les plus faiblement dosés lorsque le sirop n'existait pas, plus une préparation antitussive du commerce. Pour déterminer le coût des médicaments, nous nous sommes reportés à la liste de prix de l'*International drug price indicator guide,* édition 1996, publié par l'International Dispensary Association, un organisme international bénévole qui avait acheté des médicaments essentiels pour le compte du Kenya et les lui avait fournis à l'époque de cette étude.

Sur les 757 enfants qui répondaient aux critères d'inclusion dans l'enquête, 747 (99%) y ont effectivement participé. Le coût des médicaments prescrits était de USS 0,44 (valeur 1996) par enfant. Le produit le plus coûteux a été la phénoxyméthylpénicilline en sirop, qui représentait à lui seul 59% du coût total des médicaments. Au total, 295 (39%) des 747 enfants ont eu une ordonnance qui prescrivait ce sirop; parmi ces ordonnances, 223 (76%) étaient destinées à des enfants qui toussaient ou qui étaient enrhumés. Les médicaments recommandés dans les directives de la PCIME et consistant en comprimés plus fortement dosés plus un remède familial contre la toux, représentaient, dans le cas de l'hypothèse basse, un coût de US$ 0,16 par malade. Toujours en suivant les directives de la PCIME, mais cette fois dans le cas de l'hypothèse haute, c'est-à-dire avec l'antibiotique sous forme de sirop ou de comprimés pédiatriques plus un sirop antitussif du commerce à la place du remède familial, le coût par malade était égal à US$ 0,39 en moyenne; le co-trimoxazole en sirop et le sirop contre la toux représentaient respectivement 48 et 31% du coût total des médicaments.

Ni les directives nationales kényennes ni celles de l'OMS (PCIME) ne recommandent le recours systématique aux antibiotiques en cas de toux ou de rhume. Notre étude montre qu'en évitant la prescription inadaptée de sirop à la phénoxyméthylpénicilline, on aurait réduit de moitié le coût des médicaments. Le coût moyen du traitement des malades de notre étude selon les directives de la PCIME aurait varié dans d'importantes proportions en fonction de la forme galénique retenue et du choix de l'antitussif : préparation du commerce ou remède familial; quoi qu'il en soit, ce coût serait resté inférieur à celui des médicaments qui ont été effectivement prescrits.

Resumen

Tratamiento en centros de salud rurales de Kenya: proyección del gasto en medicamentos con arreglo a las directrices OMS-UNICEF de atención integrada a las enfermedades prevalentes de la infancia (AIEPI)

La OMS y el UNICEF han elaborado unas directrices de atención integrada a las enfermedades prevalentes de la infancia (AIEPI) en centros de salud periféricos al objeto de mejorar el reconocimiento y tratamiento de causas comunes de defunción infantil. A fin de evaluar la repercusión de las directrices en el costo de los tratamientos, comparamos el costo de los medicamentos realmente prescritos a una muestra de niños enfermos de 2-59 meses de edad en centros de salud rurales de dos distritos del oeste de Kenya con el costo de los medicamentos que se habrían prescrito si se les hubiese tratado siguiendo las directrices de AIEPI.

Dado que muchos medicamentos existen en varias formas farmacéuticas, hicimos i) una estimación de bajo costo, basada en la combinación de los comprimidos de dosis más altas de los medicamentos recomendados y de un remedio casero para los niños con tos o síntomas de catarro, y ii) una estimación de alto costo, basada en la combinación de un jarabe, o de los comprimidos de dosis más bajas del medicamento recomendado cuando no existía esa forma farmacéutica, y de un preparado antitusígeno comercial. El gasto en fármacos se calculó a partir de los precios unitarios que se indican en la *International drug price indicator guide* de 1996, publicada por la Asociación Internacional de Dispensarios, organismo internacional no lucrativo que suministró medicamentos esenciales a Kenya durante el periodo de estudio.

De los 757 niños que reunían las condiciones para ser incluidos en el estudio, participaron finalmente 747 (99%). El costo de los medicamentos realmente prescritos fue de US$ 0,44 (US$ de 1996) por niño. El producto más caro fue el jarabe de fenoximetilpenicilina, que representó el 59% del gasto global en medicamentos. En total, se recetó dicho jarabe a 295 (39%) de los 747 niños; 223 (76%) de esas recetas correspondieron a niños con diagnóstico de tos o catarro. La estimación de bajo costo de los medicamentos recomendados en las directrices de AIEPI, basada en la combinación de comprimidos de dosis altas y de un remedio casero contra la tos, fue como promedio de US$ 0,16 por paciente. La estimación de alto costo, basada en la combinación de un jarabe del medicamento recomendado, o en su lugar de comprimidos de dosis pediátricas, y de un jarabe comercial contra la tos en vez del remedio casero, fue como promedio de US$ 0,39 por paciente; el jarabe de cotrimoxazol y el jarabe antitusígeno representaron el 48% y el 31% del gasto total en medicamentos, respectivamente.

Ni las directrices nacionales de Kenya ni las de la OMS (AIEPI) recomiendan el uso sistemático de antibióticos contra los resfriados y la tos. Nuestro estudio muestra que, de haberse evitado el uso improcedente del jarabe de fenoximetilpenicilina, se habría reducido a la mitad el costo de los medicamentos prescritos. El costo promedio del tratamiento aplicado a los pacientes considerados en este estudio con arreglo a las directrices de AIEPI habría variado considerablemente según la forma farmacéutica elegida y según se hubiera empleado contra la tos un preparado comercial o un remedio casero; así y todo, su costo habría sido menor que el de los medicamentos que realmente se prescribieron.

References

1. **Perkins BA et al.** Evaluation of an algorithm for integrated management of childhood illness in an area of Kenya with high malaria transmission. *Bulletin of the World Health Organization*, 1997, **75** (Suppl. 1): 33–42.
2. **National Council for Population and Development (NCPD), Central Bureau of Statistics (CBS), & Macro International (MI) Inc.** *Kenya demographic and health survey 1993.* Calverton, MD (USA), NCPD, CBS & MI, 1994.
3. **Agwanda RO, Kwamanga DO, Kiugu SK.** Essential drugs supply and usage as a reflection of outpatient morbidity in Kirinyaga District, Kenya. *East African medical journal,* 1996, **73**: 120–125.
4. **Gove S.** Integrated management of childhood illness by outpatient health workers: technical basis and overview. *Bulletin of the World Health Organization,* 1997, **75** (Suppl. 1): 7–24.
5. **Rapuoda BA et al.** *Status of anti-malarial drugs sensitivity in Kenya.* Report by the Division of Vector Borne Diseases, Ministry of Health, Kenya, September 1996.
6. **Ministry of Health, Kenya.** *National guidelines for diagnosis, treatment and prevention of malaria for health workers.* January 1997.
7. **Ministry of Health, Kenya.** *Clinical guidelines.* Nairobi, Regal Press Kenya Ltd, 1994.
8. **Management Sciences for Health.** *International drug price indicator guide, 1996.* Arlington, Management Sciences for Health, 1996.
9. **Essential Drugs Programme, Ministry of Health, Kenya.** *Rural Health Centre ration kit II A/1, packing list drug information sheets,* 1994.
10. **Soumerai SB et al.** Withdrawing payment for nonscientific drug therapy. *Journal of the American Medical Association,* 1990, **263**: 831–839.
11. **Ellerbeck E et al.** Caretaker compliance with different antibiotic formulations for treatment of childhood pneumonia. *Journal of tropical pediatrics,* 1995, **41**: 103–108.