

# Update / Le point

## Integrated management of the sick child\*

World Health Organization, Division of Diarrhoeal and Acute Respiratory Disease Control<sup>1</sup>

*Diarrhoea, pneumonia, measles, malaria and malnutrition account for more than 70% of deaths and health facility visits among children under 5 years of age in developing countries. A number of programmes in WHO and UNICEF have developed an approach to the integrated management of the sick child, which is being coordinated by WHO's Division for the Control of Diarrhoeal and Acute Respiratory Disease. Integrated clinical guidelines have been developed and a training course for health workers in outpatient (first level) health facilities has been completed. In addition to case management of these diseases, the course incorporates significant prevention of disease through promotion of breast-feeding, counselling to solve feeding problems, and immunization of sick children. Other materials to train and support health workers are also being developed: an inpatient case management training course, medical school curricular materials, a drug supply management course, and materials to support monitoring and reinforcement of skills after training. A planning guide for interventions to improve household management of childhood illness is also being developed. Since management of the sick child is a cost-effective health intervention, which has been estimated to have a large impact on the global burden of disease in developing countries, the completion of these materials and their wide implementation should have a substantial impact on child mortality.*

### Introduction

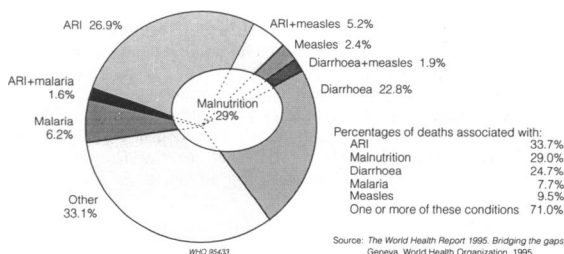
#### *The need for an integrated approach to sick children*

Every year some 12 million children die before they reach their fifth birthday, many of them during the first year of life. The majority (70%) of these deaths are due to diarrhoea, pneumonia, measles, malaria or malnutrition — and often to a combination of these conditions (Fig. 1). In addition to this substantial mortality, these conditions typically account for three out of four sick children seeking care at a health facility (Fig. 2).

A single diagnosis for a sick child is often inappropriate because it identifies only the most apparent

problem, and can lead to an associated and potentially life-threatening condition being overlooked. Treating the child may be complicated by the need to combine therapies for two or more conditions. In addition, the signs and symptoms of several of the major childhood diseases overlap substantially. Therefore, child health programmes should address the sick child as a whole and not single diseases.

Fig. 1. Distribution of 12.2 million deaths among under-5-year-olds in all developing countries, 1993.

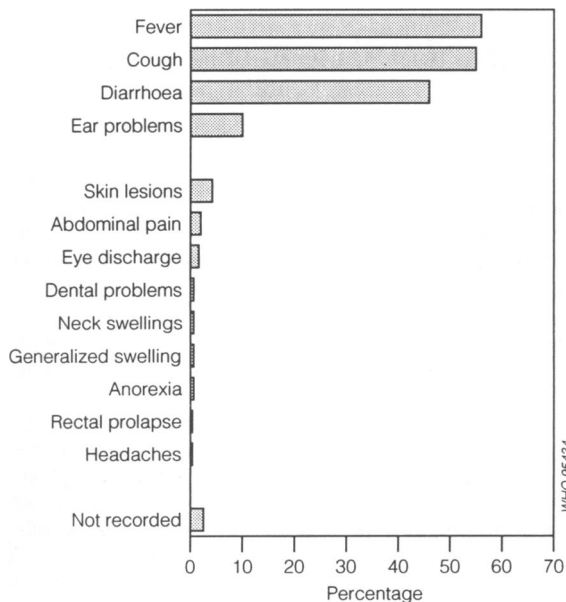


\* A French translation of this article will appear in a later issue of the *Bulletin*.

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Reprint No. 5653

Fig. 2. Percentage frequency of presenting complaints of 450 children (as given by their mothers), Gondar (Ethiopia), 1994. Based on data from Dr E. Simoes (personal communication).



Much has been learned from disease-specific control programmes in the past 15 years. The challenge is to combine these lessons into a single, more efficient and effective approach to managing childhood illness. A number of programmes in WHO<sup>a</sup> and UNICEF<sup>b</sup> have responded to this challenge and developed an approach called the integrated management of the sick child. These efforts are coordinated by WHO's Division of Diarrhoeal and Acute Respiratory Disease Control (CDR). Already many other agencies, institutions and individuals are contributing to this initiative.

<sup>a</sup> In WHO: Division of Diarrhoeal and Acute Respiratory Disease Control (CDR), Division of Communicable Diseases (CDS), Division of Control of Tropical Diseases (CTD), Action Programme on Essential Drugs (DAP), Global Programme on AIDS (GPA), Global Programme for Vaccines and Immunization (GPV), Maternal and Child Health and Family Planning (MCH), Nutrition (NUT), Oral Health (ORH), Programme for the Prevention of Blindness (PBL), and the Special Programme for Research and Training in Tropical Diseases (TDR).

<sup>b</sup> In UNICEF: Child Survival Unit, Bamako Initiative Unit, and Nutrition Unit.

Studies of health workers performance and of management of illness in the home suggest that, in both these areas, improvements can be made that are likely to reduce mortality significantly. As potentially fatal illnesses in children are often brought to the attention of health workers at first-level outpatient facilities, the initial focus of the new initiative is to improve the performance of these workers through training and support. At the same time approaches to change the behaviour of families and their response to sick children, including when and where they should seek care outside the home, are being developed.

### Developing integrated case management guidelines

Integrated guidelines for management of the sick child have been developed through a process of review of existing disease-specific guidelines, research, drafting, and field testing. They express, as simply as possible, what needs to be done for sick children in order to reduce mortality and prevent significant disability. Cases are diagnosed without laboratory tests, using simple clinical signs that strike a balance between sensitivity and specificity, which health workers from various backgrounds can be trained to recognize accurately. The algorithm for the assessment and classification of the child's illness has been refined through studies in the Gambia, Kenya, and Ethiopia, which compared a health worker's assessment after training with that of an expert paediatrician.

The integrated guidelines are presented on four wall charts, the contents of which are also reproduced as a booklet.<sup>c</sup>

### Case management process

The case management process, as laid out in the charts, involves the following steps.

- The health worker first *assesses* the child by asking questions, examining the child, and checking the immunization status.
- Then the health worker *classifies* the child's illnesses, using a colour-coded triage system. Many health workers are already familiar with this through the WHO case management guidelines for diarrhoea and acute respiratory infections (ARI). Each illness is classified according to whether it requires:
  - urgent referral;

<sup>c</sup> *Management of childhood illness. Chart booklet.* Unpublished WHO document, 1995 (no number).

- specific medical treatment and advice; or
- simple advice on home management.
- After this classification, *specific treatments are identified*. If the child is to be referred urgently, the health worker gives only essential treatment before the patient is transferred. Since most children have more than one illness, an integrated treatment plan is developed.
- Practical *treatment instructions* are followed, including how to teach the mother to administer oral drugs, to increase fluid intake during diarrhoea, and to treat local infections at home. The mother is advised on how to recognize the signs which indicate that the child should immediately be brought to the clinic and is given the dates for routine follow-up.
- Feeding is assessed and *counselling on feeding problems* provided.
- *Follow-up* instructions for the various conditions are given when the child returns to the clinic.

## Management of childhood illness

### **A training course for first-level facility health workers**

A training course in the use of the case management process was developed for first-level facility health workers with the ability to read with ease and understand the written learning materials. The full 11-day course combines classroom work and hands-on clinical practice built around the integrated case management guidelines. The seven training modules incorporate photo and video exercises, individual feedback on exercises, group discussions and drills, and role plays. The mornings are spent in the clinic or hospital with the sick children, the course providing substantial clinical experience in assessment, classification, treatment and counselling over ten clinical sessions. The participants manage the sick children under supervision in the outpatient clinic and assess and classify hospitalized children under the guidance of a skilled clinical instructor. Each participant sees 30–50 sick children.

Communication skills are emphasized in the course and are taught from the first day in each module and during clinical practice, as well as in role plays in the classroom.

### **Conditions covered by the course**

At the start of the assessment process all the children are checked for *general danger signs* which are not disease-specific, e.g., a child who is lethargic or unconscious, or is unable to drink or breast-feed, or

vomits everything, or has had convulsions during the illness. These signs may indicate a severe illness requiring urgent referral.

In the case of children aged between 2 months and 5 years, the health worker then asks about four main presenting symptoms: cough or difficult breathing, diarrhoea, fever, and ear problems.

- The child presenting with *cough or difficult breathing* is assessed by the rate of breathing (per minute), looking for chest indrawing and listening for stridor. Chest indrawing, stridor when the child is calm, or one of the general danger signs indicates severe pneumonia or a very severe disease which requires referral. Children with fast breathing alone are classified as having pneumonia. The absence of these signs indicates a simple cough or cold. Children who have been coughing for more than 30 days are referred for further investigation of tuberculosis and other conditions. These guidelines are almost identical with the existing WHO/ARI case management guidelines.<sup>d, e</sup>

- Health workers are taught how to manage *acute watery diarrhoea* (including cholera), *dysentery* (bloody diarrhoea), and *persistent diarrhoea* (diarrhoea for 14 days or more). The assessment and classification of dehydration has been simplified, drawing on years of clinical experience with the WHO diarrhoea case management chart. Rehydration therapy is provided to treat clinically apparent dehydration (fluid Plans B and C in the WHO chart) or to prevent it from developing (fluid Plan A). Dysentery is treated with an oral antibiotic effective against *Shigella*. Careful nutritional management is provided for persistent diarrhoea, and any extra-intestinal infections which may be contributing to the problem are treated.

- Children with *fever* are evaluated for the presence of the most common potentially fatal febrile illnesses. A child with fever and a stiff neck or a general danger sign may have severe malaria, meningitis or some other very severe febrile disease. Such children are referred urgently to hospital after treatment with an antibiotic and, in malarious areas, quinine. Management of febrile children without these severe signs depends on whether the risk of malaria is high or low. In an area or season with a high malaria risk, all children with fever or a history of fever are treated with the oral first-line antimalarial. If the malaria

<sup>d</sup> WHO Programme for the Control of Respiratory Infections. *Management of the young child with an acute respiratory infection*. Unpublished WHO document, revised 1991.

<sup>e</sup> *Acute respiratory infections in children. Case management in small hospitals in developing countries*. Unpublished WHO document, WHO/ARI/90.5, 1990.

risk is low, the child is given an antimalarial only if another cause for the fever is not apparent. Any child with a fever every day for more than 7 days is referred for investigation of typhoid and other conditions.

Given the overlap in clinical presentation and the efficacy of co-trimoxazole in the treatment of both pneumonia and falciparum malaria,<sup>f, g</sup> co-trimoxazole alone is recommended for the treatment of children who present with cough, fast breathing and fever (in settings where falciparum malaria is sensitive to sulfadoxine-pyrimethamine and where this recommendation has been incorporated into national policy).

Fever is also the starting point for a diagnosis of *measles*. Despite substantial success in improving immunization coverage in many developing countries, many measles cases continue to occur. Their case-fatality rate can be reduced by good management of the common complications and use of vitamin A.

- A history and simple examination can lead to diagnosis of mastoiditis and acute and chronic *ear infections*. Health workers learn to teach mothers how to wick dry a draining ear and that, while antibiotics are given for acute ear infection, cases of mastoiditis should be referred.

All children are assessed for *malnutrition and anaemia*. Visible severe wasting (marasmus) and oedema of both feet (kwashiorkor) identify children with severe malnutrition who need urgent referral to hospital. A very low weight-for-age identifies a group of malnourished children whose weight gain should be monitored in a follow-up visit and whose feeding needs careful assessment so that any problems can be remedied.

Severe palmar pallor is present in a high proportion of children with severe anaemia who require referral to hospital for transfusion; others requiring transfusion present with cough or difficult breathing and are referred with the classification of severe pneumonia or very severe disease.<sup>h</sup> Children with some palmar pallor are treated with oral iron for two months.

A similar process — assess, classify, identify treatment, treat, and counsel — is taught for the management of the *sick young infant* (age 1 week up to 2 months) as for the sick child (age 2 months up to 5 years). Because the signs of pneumonia and

other *serious bacterial infections* cannot easily be distinguished, every young infant is assessed for a set of signs and, if any one sign is present, they are classified as having a possible serious bacterial infection. These infants are referred urgently after initial treatment, which includes antibiotics and breast milk or sugar water to prevent low blood sugar.

### **Preventive interventions covered in the course**

In addition to case management of the most important diseases, the course includes prevention of disease through the promotion of breast-feeding, advice on solving feeding problems, and improved immunization coverage by ensuring the immunization of sick children. Encounters with sick children provide an opportunity for the delivery of sound, consistent advice on the nutrition of the young child both during and after illness, which may have a significant impact in reducing the adverse effect of infections on nutritional status.

A *feeding assessment* is carried out for children who are less than 2 years of age or are very low weight-for-age, and their feeding is compared with age-specific feeding recommendations. Local adaptation of these recommendations and identification of common feeding problems are an important step in adapting the course to each country. To try to achieve an impact on child nutrition, the *nutrition counselling* focuses on remediable feeding problems, rather than providing general nutritional advice. Children with a feeding problem are followed up to provide further help in resolving feeding problems and to check on their weight gain.

Exclusive *breast-feeding* is encouraged for the first 4–6 months and guidance is provided to solve important problems; use of bottle-feeding is discouraged at any age. A young infant with difficulty in breast-feeding, or who is low weight-for-age, or is not breast-feeding often enough or exclusively is observed during feeding. This assessment determines whether the infant's attachment on the breast is good and whether suckling is effective. If these are not satisfactory, the health worker is trained to help the mother to improve the infant's position and attachment.

Each child's *immunization status* is checked and vaccinations are given as needed. The importance of immunizing sick children who are not referred to hospital is taught repeatedly and reinforced, so that there will be fewer missed opportunities for immunization.

In countries where vitamin A deficiency is a problem, sick child encounters can be used as an opportunity to provide periodic *vitamin A supplementation*.

<sup>f</sup> *The overlap in the clinical presentation and treatment of malaria and pneumonia in children: report of a meeting*. Unpublished WHO document WHO/ARI/92.23, 1992.

<sup>g</sup> *Antimalarial drug policies: data requirements, treatment of uncomplicated malaria and management of malaria in pregnancy*. Unpublished WHO document WHO/MAL/94.1070, 1994.

<sup>h</sup> See footnote d on page 737.

**Field testing of the training course**

A preliminary test of the course in Gondar, Ethiopia, in August 1994, followed by three weeks of observation of the performance of the trained nurses, yielded very promising results. A full field test, including materials for course instructors, was carried out in Arusha, Tanzania, in March 1995. All three types of health workers included in the field test were able to learn and apply the process of assessment, classification, treatment, and counselling at a very acceptable level of performance.

Both these tests demonstrated the effectiveness of the course for inservice training of clinical nurses and medical assistants. In the field test, health workers with little previous training (in Tanzania, rural medical aides and MCH aides) were also able to learn the case management process and performed well in the clinic; however, because they had difficulty in reading the modules in English, they required more active facilitation and were not able to complete the course in the time available. A revised, simplified course was translated into the local language and is now being tested to determine its effectiveness in training other fully literate primary health care workers with less basic training. WHO is

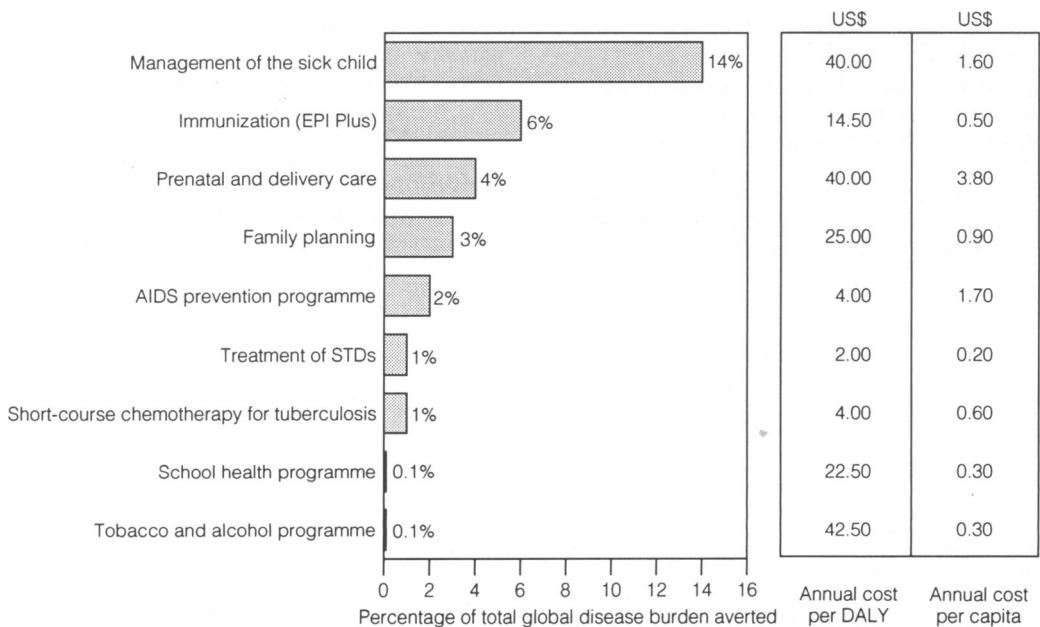
also exploring how the course might be used during pre-service training for nurses and health assistants.

The course requires adaptation to situations in countries, taking account of different disease epidemiology and country-specific policies and guidelines. An adaptation guide is being prepared to review clinical policy and guidelines, to identify the necessary adaptations of the course, and then to adapt the present charts and clinical modules. For the identification of appropriate feeding recommendations and local feeding problems, a protocol is available to guide a review of existing information and to carry out a household trial of feeding recommendations. After adaptation, the course should be translated to the language of the country.

**Potential impact and cost-effectiveness**

According to the World Bank's report for 1993 (1), management of the sick child is the intervention which is likely to have the greatest impact in reducing the global burden of disease. This approach alone is calculated to be able to prevent 14% of that burden in low-income countries. According to the report, management of the sick child ranks among the most cost-effective health interventions in both low-income and middle-income countries (Fig. 3).

**Fig. 3. Cost-effective packages of public health interventions and essential clinical services in low-income and middle-income countries.**



Source: *World development report: investing in health, 1993 (1)*.

## Future plans

The case management training course described above is only one component of an integrated approach to the management of the sick child. Other materials for training and support to health workers are described briefly below.

- As many sick children require referral to a hospital, a further training course is being developed on *inpatient case management* of the sick child.
- Medical school *curricular materials* including a manual for students on individual disease topics and their integration are being developed. This will expand on the materials already produced for diarrhoeal disease.<sup>1</sup>
- To improve the *management of drug supplies* at health facilities, which is essential for effective case management, materials for conducting a training workshop followed by supervised practice in the health facility have been developed in collaboration with the USAID-funded BASICS (Basic Support to Institutionalizing Child Survival) Project.
- To maintain good performance in the management of sick children, training in *monitoring and skill reinforcement* will be provided to all health workers who have completed the course on management of childhood illness. Further training on subjects not fully covered in the course will be implemented through health facility visits, distance learning materials, and refresher training sessions in district hospitals.
- A planning guide is being developed in response to the need for *interventions to improve household management of childhood illness*, including

timely care-seeking. The guide provides a systematic process for assessing current problems in household management, identifying culturally appropriate interventions, and implementing and evaluating them.

In addition, WHO (Division of Diarrhoeal and Acute Respiratory Disease Control) has drawn up a list of research priorities related to integrated management of the sick child and will support an active research programme focused on these priorities. Research relevant to malaria case management within integrated management of the sick child is supported by the Applied Field Research Task Force on the Sick Child, WHO Special Programme for Research and Training in Tropical Diseases (TDR).

The concept of the integrated approach to childhood illness has been welcomed by many countries. In some it will fit well into reorganizations of health service management that are already under way. In others, organizational changes or clearly defined collaborative arrangements between existing disease-specific programmes will be needed.

WHO, UNICEF, the World Bank and their collaborative partners will work with countries to help adapt the new materials to the country context, to plan how implementation of activities can best be managed, and to evaluate the experience. Particularly close monitoring of initial experience will be carried out in a small number of countries. In order to facilitate further progress in this important new initiative and to ensure maximum collaboration from other agencies and institutions, WHO will continue to hold periodic meetings to coordinate research, development and implementation activities.

## Reference

1. **The World Bank.** *World development report 1993: investing in health.* New York, Oxford University Press, 1993.

<sup>1</sup> *References on diarrhoea. Strengthening the teaching of diarrhoeal diseases in medical schools.* Unpublished WHO document, 1993 (no number).