EVIDENCE BASE FOR THE COMMUNITY MANAGEMENT OF PNEUMONIA

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DEPARTMENT OF CHILD AND ADOLESCENT HEALTH AND DEVELOPMENT

WORLD HEALTH ORGANIZATION

1. Introduction

1.1 Background

Although the past 15 years have seen a decline in child mortality due to pneumonia, it remains a very important cause of death in developing countries. In Africa in particular, pneumonia and malaria are by far the most important causes of death for children under 5. The overall aim of this meeting was to help to define practical community approaches which could deliver a rapid reduction in this preventable mortality.

WHO has developed and supported the use of case management of pneumonia through the ARI Programme and later as a part of IMCI. The main focus for these initiatives has been the health facility, although much of the demonstration of the efficacy of the clinical interventions was carried out at community level, using community health workers. IMCI uses the same clinical methodology. Although IMCI stresses the promotion of care-seeking by families with sick children, in general, the clinical management of such children is offered at the first level health facility.

The importance of providing care without delay for children with malaria has led to the development and introduction, so far on a small scale, of interventions based in the community, either through a community health worker or directly by families, who are provided with packs of antimalarials.

These two diseases in childhood, pneumonia and malaria, have major overlaps in terms of clinical presentation, the requirements for their effective management and the feasibility of providing standardised care in the community. Technically sound and operationally manageable community interventions that tackled both conditions would offer a most valuable tool for use in the reduction in child mortality in developing countries.

1.2 Objectives of the meeting

- Review of the management of acute respiratory infections (ARI) in children.
- Review of published and unpublished evidence concerning community management of pneumonia and other childhood illness – including research and programme experience.
- Identification of gaps in knowledge and recommendations for addressing the gaps in knowledge (e.g., research) and management of pneumonia in the community.

1.3 Agenda

The agenda followed the objectives. The detailed agenda is attached as Annex 1.

1.4 Participants

The 30 participants were drawn from research institutions, countries with experience of community activities relating to pneumonia and malaria, and national and international agencies. The full list of participants is attached as Annex 2.

2. Proceedings

The main points of the presentations and the ensuing discussions are summarised below under each of the meeting's objectives.

2.1 Objective 1 – Review of the management of acute respiratory infection (ARI) in children

2.1.1 Management of children with ARI –the public health perspective. S. Qazi.

The case management of pneumonia developed and promoted by WHO is based on a number of premises:

- Pneumonia is a common cause of child mortality
- The majority of pneumonia in children in countries with high infant mortality is of bacterial origin – mostly *Streptococcus pneumoniae* or *Haemophilus influenzae* - which can be effectively treated using inexpensive antibiotics that can be administered at home
- Children with respiratory infections requiring antibiotic treatment at home or referral care can be recognised using signs (rapid respiration and lower chest indrawing) that can be learned and used by health workers with limited clinical training and no capacity for laboratory investigation or radiology.

The effective use of this clinical methodology depends on two things:

- The child must be recognised by the family or caretaker as needing clinical care and must be brought promptly to such care

- There must be access to appropriate care, including skills in case recognition and management, the availability of a suitable antibiotic and referral care for the child who has severe illness.

The main approach to putting these requirements in place has been through strengthening the public health services - particularly through training health workers and building the capacity at the first level health facility - and education of families and communities. These activities were initially carried out through national ARI programmes. They became part of the IMCI strategy from 1995. There has been little substantive effort to date to involve the private sector.

The WHO ARI programme tested the standard case management methodology mainly through community-based programmes, and in 1992 it introduced a training course in standard case management of ARI for community health workers. This course was not widely used, in part because of the reluctance of many national authorities to allow antibiotics to be distributed by such workers (some data on the outcome of the use of this course was presented at the meeting - see under objective 2 b).

The treatment of pneumonia demands that effective antibiotics should be available, and the monitoring of the efficacy of affordable antibiotics is therefore an important component of ARI control activities.

2.1.2 What do we know about the quality of care for ARI in health facilities? S. Aboubaker

Data from ARI health facility surveys between 1992 and 1997 gave a picture of the quality of care provided in first level health facilities by trained health workers. In general the results show that although training and the attention given to drugs supplies may improve care, the quality was variable. The table below summarises the major findings of 20 surveys of health facilities in 19 countries.

	% staff trained in ARI	% ARI cases managed correctly	% ARI cases to whom antibiotics were given unnecessarily	% facilities with antibiotics	% facilities with capacity to give ARI standard case management*
Minimum	18	2	8	27	2
Median	52	30	31	79	55
Maximum	88	73	70	100	87

*Facilities with at least one health worker trained in ARI and a continuous supply of suitable antibiotics.

Surveys done in a few countries following the introduction of IMCI have shown significant improvements in the capacity for and practice of appropriate case management for ARI in first level health facilities.

2.1.3 Symptom overlap for pneumonia and malaria in Ugandan under-fives seeking care at health centres. S. Peterson, K. Källander, J. Nsungwa-Sabiiti

In sub-Saharan Africa there are three episodes of malaria for every one episode of pneumonia in children. IMCI equates fever with malaria in malaria-endemic areas, and uses cough or difficult breathing and fast breathing as the signs of pneumonia. In this study 30% of children seen had both fever and were coughing and had fast breathing, and would thus receive treatment for both malaria and pneumonia. The symptom overlap was found to increase with the duration of both the fever and cough, and there is more overlap in younger children.

These data are from health facilities (used by only 8% of cases) and cannot be extrapolated to a community situation, but they do suggest that the overlap, which cannot be resolved without more sophisticated diagnostic procedures, is such that treatment for both conditions should be available within the community.

Overlap between clinical malaria and pneumonia is important both for the care of the individual child and for the development of child health strategies involving case management. The Meeting recommended further research to define more effective ways of managing children affected by this overlap, including the development of practical clinical algorithms which deal with the overlap.

2.2 Objective 2a.   Review evidence concerning community management of ARI – research

2.2.1 Management of children with ARI – the family perspective. G. Pelto

Assuring the well-being and healthy development of children always involves a partnership between families and the larger society of which they are a part. Specific features of the family/society partnership are different for different types of diseases and for different aspects of disease prevention and management. In relation to ARI the family responsibilities are:

- to know and to recognise the signs of a potentially serious episode of ARI
- to seek help promptly from someone who knows what to do, can give the family advice and can provide medication
- to follow the advice and treat the child correctly, including returning for help as necessary

ARI focused ethnographic studies showed that there are often important gaps in the family's capacity to fulfil these tasks, in particular to recognise that a child has a serious respiratory problem, and that in working to improve care seeking and home treatment health workers must be aware of and respect the family's position and perceptions.

In many situations it is unrealistic to expect mothers and families to take the responsibility for recognizing the signs that a child requires specific treatment. This should change as levels of education and empowerment increase. At present, in the division of labour between families and society, society should normally assume responsibility for meeting the need of families for access to diagnostic skills and treatment. Lack of such access is the main determinant of the speed of care-seeking – itself a crucial determinant of survival for the child with severe pneumonia or malaria.

2.2.2 Meta-analysis of community-based trials of case management of pneumonia. R. Black

The results of seven concurrent trials were included in the analysis. The trials had taken place in Bangladesh, India (2), Nepal, Pakistan, Philippines and Tanzania. All had involved education of caretakers, either at home or in the clinic, in care seeking, and in six sites the community health workers undertook active case-finding. Mortality surveillance and verbal autopsy were used in all trials. The effects of these trials on mortality in their target populations are summarised below.

Summary of effects of pneumonia case management on mortality - concurrent, controlled trials. Odds ratios

Age group	Total mortality	Pneumonia-specific mortality
<1 month	0.70 (0.59, 0.84)	0.56 (0.37, 0.83)
<1 year	0.74 (0.63, 0.87)	0.63 (0.46, 0.86)
0 to 4 years	0.74 (0.64, 0.86)	0.63 (0.47, 0.86)

The main conclusions from the meta-analysis were:
- The trials resulted in a reduction of child mortality of 26% and a 37% reduction in mortality from pneumonia.
- This was accomplished by community health workers diagnosing the illness and providing oral antibiotics or referral as needed.
- Regular household visits were an important part of the intervention, but this may not be feasible everywhere. It was noted that many cases were brought to the health workers outside household visits.
- The health workers had been carefully selected, trained and supervised. Antibiotics were reliably available.

2.2.3 Early and appropriate home management of childhood fevers (malaria and ARI) in Uganda. B. Mpeka

Faced with slow progress in developing effective services to reduce under-5 mortality and morbidity care for children with malaria, WHO Tropical Disease Research is supporting studies to provide evidence and best practices for early management of malaria. Some of the countries involved have decided to take a broad approach. Uganda, Nigeria and Burkina Faso aim to increase the timeliness and appropriateness of treatment for malaria. Ethiopia is measuring mortality reduction, Burkina Faso plans to monitor reductions in severe disease and Kenya is focusing on improving the prescribing practices of shopkeepers.

In Uganda, unpaid female community volunteers have been given a three-day training to advise mothers of children with fever and provide them with antimalarial drugs made up in age-specific bubble packs, or refer them if necessary. In the small-scale test that has been carried out they were closely supervised by district health workers and the research team.   The training includes the management of ARI. The training for case recognition of pneumonia does not include the counting of respiration. Instead, reliance is placed on the mothers' ability to recognize abnormal breathing and to use local terminology indicating severe illness. This has not been tested or shown to work elsewhere, but ethnographic studies have found a wide variation in the ability of mothers to recognise signs indicative of pneumonia (see 2.2.1 above).

It is planned that the exercise will be taken to scale in Uganda, covering much of the country. There is no direct association in this expansion with the community IMCI activities that are being developed and implemented in Uganda and which include community volunteer activities in some districts.

Discussion of the trial raised issues of the policy support needed for the use of drugs by minimally trained workers, and of the capacity of the health system to provide the technical support that these workers would need. Effective approaches to child survival call for simultaneous building on one hand of the capacity of the family for care seeking and home care and on the other of the capacity of the health system to provide support for case management and referral. The results of the small-scale trial that has been completed are promising, but future expansion of this community-based approach, as for other new interventions, should be carefully monitored to provide convincing evidence of efficacy.

2.2.4 Antimicrobial use and misuse in Acute Respiratory Infection. K. Holloway

Over-use of antibiotics is widespread and has serious public health consequences. Half or more of antibiotic prescription is unnecessary, viral ARI being one of the most common pretexts. In addition, antibiotic courses are often not completed. Between 50 and 90% of all antibiotics are

prescribed by the private sector. Poorly controlled use is associated with increasing resistance of respiratory pathogens. Studies show up to 70% of pneumococci resistant to penicillin.

The quality and effectiveness of treatment may be compromised by the combination of family poverty, which can reduce access to full treatment, and malnutrition, which may reduce its efficacy. Approaches are needed to ensuring effective treatment for poorer families without creating second-class care.

The treatment choices of health workers and families are affected by many factors and experience shows that practices can be changed. Although guidelines and regulations are usually not enough on their own, combinations of ongoing training and supervision have been shown to produce important changes. Some of the most rational use of antibiotics has been demonstrated in community programmes, but this may be put at risk when community workers are dependent on income from the sale of medicines.

Work is needed to introduce those interventions that are known to be effective for improving the rational prescription and use of antibiotics into the reality of the public/private health care systems.

2.3 Objective 2b. Review evidence concerning community management of ARI: programme experience

2.3.1 Evidence on the performance of CHWs trained in the management of ARI. S. Aboubaker

Community health workers were trained in several countries with the WHO ARI training course for CHWs. The follow-up showed encouraging evidence that, with suitable supervision and provision of medicines, CHWs could perform these tasks well. Data from the follow-up in China and Sudan are shown below.

Assessment 6 months after training

Task	China VHWs - 1997	Sudan CHWs 1995
Breathing rate counted	34/34	22/23
Chest indrawing assessed	26/34	21/23
Antibiotics given correctly for pneumonia case	5/5	4/4
Children not needing antibiotics who were given antibiotics	4/25	1/14

The successful management of pneumonia in children is dependent on the child's condition being recognised by the family and the child being brought to someone who can provide correct care with antibiotics. Eighteen ARI Household Surveys were reported by 12 countries between 1992 and 1997. They provide some light on the subject of care seeking and home care in areas where health facility workers have been trained for ARI case management.

	% Caretakers knowing when to seek care for cough	% Children with ANA* taken to appropriate provider	% Children with cough given antibiotic	% Children with cough or ANA given harmful drugs
Minimum	14	20	8	3
Median	40	74	26	14
Maximum	67	89	84	56

*Episode of ARI Needing Assessment

The planning and development of a community-based system for care for ARI must include the strengthening of the families' capacity to seek care and to give treatment as well as the capacity of the community health worker and the health facilities to provide appropriate case management.

2.3.2 Management of ARI at the Community level: experience from Pakistan. Syed Zulfiquar Ali.

The management of ARI has been included since 1993 in the work of the Lady Health Workers (LHW), who are the community level health workers of the National Programme for Family Planning and Primary Health Care. Their tasks include improving community awareness and changes in attitudes to health, providing promotive, preventive and curative PHC services, and integrating existing vertical programmes at the level of the community.

The LHWs are paid employees of the Ministry of Health. They are selected by the communities they serve and receive a staggered theoretical and practical training lasting about 15 months. They live and work in their villages and maintain a regular cycle of household visits in addition to being available for consultation. They are responsible to the District Health Office but have a separate supervision system because many District Health Offices lacked the capacity to provide the necessary support. Supervision is recognised as being crucial to the success of the programme and is allotted considerable resources.

The Programme is seen as a priority and it is funded almost entirely directly by the Government. The Programme now covers about 35% of the population – more than 30 million people. The annual attrition rate of LHWs is about 3 percent.

The LHWs are charged with sustaining a detailed data collection and monitoring system, which is the basis for their supervision and continuing training.

The prevention and treatment of ARI are part of the LHWs' functions. Their training follows the WHO community health worker training guidelines for ARI, and they are provided with cotrimoxazole. Recent evaluations show that their knowledge and practice of ARI case management are reasonable, but antibiotic use is still insufficiently rational.

The results of the evaluation showed that the population served by LHWs has better "intermediate" health measures than the control population. They suggest that LHWs are producing a substantial impact on the uptake of important primary health services. The evaluation did not demonstrate any effect on child mortality. The programme is felt to have met one of its key objectives; that of providing and promoting PHC services for children and women.

The Programme recognises weaknesses in the continuing contact of LHWs with their trainers. Access to and utilization of the government health facilities is low, which reduces the availability of referral care – an important issue for the management of severely ill children. There is some concern over the quality of the training offered to LHWs, and particularly on the amount of practical experience. For the future the Programme intends to focus on strengthening supervision and training. The principles of "Community IMCI" will be adopted for community development. The weakness of the health facilities is a major problem beyond the control of the Programme, but it is to be addressed as a part of overall health service development. The functional separation of the LHWs from the district health offices is a serious problem in the same category.

The continuing priority being given to this programme by the Government is the result of strong leadership and effective advocacy using available information. In general the Programme has been well accepted by academics, who have been involved at all stages and are kept up to date.

2.3.3 Honduras' experience: pneumonia management at the community level (CMP). J Meléndes, G. Corrales

Although infant and child mortality rates are declining, pneumonia remains the most important cause of death in these age groups, particularly among less educated, poor rural families where the prevalence of malnutrition is high. The main reasons for this have been a lack of awareness of the signs of ARI and the subsequent delays in treatment.

The community programme, which originally dealt only with ARI, was started to improve early detection, treatment and referral (when necessary) of childhood pneumonia. It focused its activities on isolated communities. The

programme works though unpaid community volunteers. They are selected by the community and trained and supervised by the MOH as part of the national ARI programme. Volunteers are supervised monthly for the first six months after training and three times a year thereafter.

The tasks of the volunteers are to educate the population and to provide treatment for pneumonia, using cotrimoxazole, with which they are supplied, or referring to the health facilities as necessary.

Mortality is the main indicator of effectiveness of the programme. Figures show a decline in the number of child deaths in programme areas. There has been a reduction in the number of children seeking care for ARI in health facilities and a small increase in the number of children referred for care of severe pneumonia. This represents an overall saving in service costs.

The Programme has trained 1500 volunteers in 800 communities. Turnover of volunteers is rapid in some communities and this has necessitated maintaining capacity for continuous training. The Programme does not see this as a problem, particularly as ex-volunteers will take their skills with them and increase the knowledge and skills of the community.

The Programme has now become part of the integrated community child care programme (AIN-C), which offers education and provision of care for malnutrition and child health throughout the country.

The main lessons learned from the Programme have been:

- Community action through volunteers can reduce child mortality
- The essential requirements for such a programme are:
    - effective training,
    - regular supportive supervision
    - reliable supplies of drugs and timers
    - close integration with both the community and the health system
    - a sound baseline, targets, and a monitoring system which can provide data on quality and effectiveness
- For long-term effectiveness, community action for ARI should be a part of an integrated system for child care. It was noted that it has been more difficult to assure drugs supplies and regular supervision since the programme was integrated.

2.3.4 Essential Community Child Health Care (ECCHC), Southern Sudan 1999-2002. N. Zagaria

About 5 million people living in Southern Sudan have been affected by civil unrest for more than 20 years. Child mortality rates are among the highest in the world. Less than 30% of the population have access to health care, which is provided through NGOs. WHO and a partner NGO have trained guinea-worm volunteers in villages at least 8 hours walk from the nearest health

facility to provide standard case management for ARI, diarrhoea and fever, using a simplified IMCI algorithm.

The tasks and the tools have been developed specifically to meet the needs and situation of this population. As referral is not feasible, the intention is to provide care as early as possible after the onset of illness. The volunteers are provided with amoxicillin, chloroquine, paracetamol and ORS. The decision to use amoxicillin rather than cotrimoxazole was prompted by the impossibility of referring children with severe pneumonia or other severe disease.

The volunteers are literate but have had no previous formal health training. They have received 10 days of training on ECCHC. Health personnel from the primary health unit in the district were trained at the same time. The volunteers are supervised monthly, using a standard supervision process. They are not paid, but they receive in-kind incentives. Turn over is high.

Evaluation has shown that, provided close supervision and support is maintained, most volunteers give technically accurate case management. There is no information on mortality, but the villages are very satisfied with the care that they are receiving and there is some evidence of fewer children with severe pneumonia and diarrhoea presenting at the hospital.
A more complete IMCI package has now been developed and introduced for the health workers in the primary health units and hospitals (known as CHWs by the NGOs). The village volunteer programme is not fully accepted by the health authorities, who are giving priority to the training of Primary Health Unit CHWs.

The main lessons learned relate to the positive experience of teaching simple case management of ARI, fever and diarrhoea to literate individuals with no previous health training, and to the need to decentralise training as far as possible and to sustain high quality supervision. The project has shown that reasonably effective care can be achieved in conditions of the most extreme marginalisation and deprivation.

2.3.5 Community Initiative for Child Survival in Siaya District, Kenya. A. Misore

The Ministry of Health began implementation of the National ARI Programme in 1992 with the aim of reducing mortality from pneumonia, which was associated with 20 to 30% of childhood deaths. The programme was combined with CDD in 1993 and has received no funding since IMCI was introduced in 1998.

CARE-Kenya implemented the Community Initiative for Child Survival in Siaya District between 1995 and 1999. Its aims were reduction of mortality from pneumonia, malaria and diarrhoea, improvement of immunisation coverage and nutritional status and maternal health care and family planning. The project recruited 400 CHWs in 312 villages with a total population of 140,000. The CHWs were identified by the community. They were trained using

adapted IMCI material and supervised by the project and the district health staff.

Community pharmacies were also opened to provide essential drugs and bed nets. Village health communities were established. The CHWs were initially volunteers but after the first year there were demands for payment. Turnover was high.

Three rounds of evaluations over five years showed that although malaria was consistently well treated, the management of the other conditions was usually poor, with inadequate assessment, classification and treatment. The situation was not significantly improved by retraining, and clinical practice as an element of supervision proved to be difficult to achieve. The problems appeared to lie mainly in the perceived complexity of the algorithms.

The project showed success in an increased use of bed nets and contraceptives, improved care-seeking and home management of diarrhoea. There appears to have been a reduction in infant mortality during the project period.

The early and continuous involvement of national health authorities in planning and implementation of "pilot" programmes is vital for their continuity. In this case the Ministry of Health had not been closely involved in the establishment of the project and was eventually reluctant to take responsibility for its continuation.

2.3.6 The ARI strengthening programme – Nepal. S. Karki, D. Poudel, R. Houston

In Nepal it is estimated that at least 25,000 children under the age of five die each year from pneumonia. On available estimates, fewer than 20% of children with pneumonia are taken to government health facilities for care. The Jumla and Dang projects in the 1980s demonstrated that that indigenous community health workers could effectively detect and treat pneumonia, and in Jumla there was a 28% reduction in child mortality following this single primary health care intervention.

In 1993, the Ministry of Health and its donor partners in CH, USAID, John Snow Incorporated (JSI), UNICEF and WHO formed a working group to review the status of the National ARI Control Program. As a result of working group meeting, ARI Strengthening Program was initiated in two models – Treatment and Referral. Treatment model was piloted in 2 districts and referral model was piloted in 2 districts. In two "treatment" districts Female Community Health Volunteers (FCHV) were trained and equipped to diagnose and treat children with pneumonia and refer children with severe pneumonia. In two "referral" districts the FCHVs did not provide treatment but referred all cases of pneumonia and severe pneumonia. The FCHVs are local married women who volunteer to serve in their own communities. They are

supervised by the district health offices, making use of the detailed records of cases and activities.

After completion of one and half year an evaluation was carried out to decide upon the most appropriate model for expanded use in the country. The quality of care was found to be high. The FCHVs were doing correct assessment and classification in more than 80% of cases and less than three percent of children received antibiotics unnecessarily. Of all estimated cases of pneumonia in children in the intervention districts 35% received treatment in Treatment model compared to only 19% in the referral model. Therefore, the "treatment model was able to reach almost twice as many of the children at risk in the first year of the intervention. In Referral Districts, of all cases treated or referred by CHWs 3,948 or 74% were lost to followup where in treatment districts only 7% of those assessed by the CHWs were lost to followup. Therefore cautious expansion of treatment model was recommended.

Following recommendations of the ARI strengthening program assessment conducted in January/February 1997, the ARI strengthening program was expanded. By June 2002, implementation was completed in 16 districts, covering 33% of the Nepal's population under 5 years of age. Since 1997/98, over 1,500 district and health facility level health workers, over 9,000 community-level health workers, over 8,000 locally-elected leaders, and 133,000 mothers' group members have participated in trainings and orientations.

The number of cases seen by the FCHVs rose each year. In 2001/02, the percentage of all the cases of pneumonia estimated to be occurring in the community that were being treated in program districts is 60% where as in non-program districrts it was 23%. The percentage of all pneumonia cases seen at health facilities that were classified as severe pneumonia or very severe disease declined to about 8% in 2000/2001 where as in 1995/96 it was 16%.

Marking 3rd day follow up and cases marking consistent age and dose achieved in more than 90% of cases in 2000/01 It was estimated that 17,000 deaths were averted over the period of the project.

In 2000/01, over 160,000 children received pneumonia treatment in the 13 program districts, with 91,248 (56%) of these treated by CHWs. In the remainder of the country, 62 districts only 173,564 additional cases of pneumonia were identified and treated. There is still a great need to expand the community-level program nation-wide.

The numbers show not only the huge contribution made by the CHWs in extending treatment beyond the HFs, but also shows that the HFs in the ARI Program districts -are also making a significant contribution.

The main strengths of the project were the consistent commitment of the core working group, the firm commitment of the FCHVs to voluntary service, the

acceptance and belief of the communities in the service given by the FCHVs, and the recognition and support of the project by donors and partners.

Its weaknesses were the logistic problems facing the regular supply of drugs and the poor motivation and frequent transfers of health facility staff.

On the basis of the outcome of the trial, the government has decided to proceed cautiously to expand implementation of the model of the "treatment districts".

3. Objective 3. Identify gaps in knowledge and make recommendations for addressing the gaps in knowledge and management of ARI in the community

The discussions, guided by the presentations summarised above, focused mainly on issues concerning the design and implementation of effective community health programmes which use health agents of some sort in the community.

3.1 Household treatment programmes

The project in Uganda (2.2.3 above) described above places the responsibility for case recognition and treatment on the caretaker at home. It follows the principle that this reduces to a minimum the interval between the onset of illness and the start of treatment. The length of this interval is a major determinant of survival for children with malaria, particularly for the younger infant.

For this approach to work, the caretaker must be able to recognise signs of the child's illness. In the case of malaria this means recognising fever, and there is evidence that mothers can do this well in most circumstances.

Blister packs of chloroquine are now available, and WHO intends shortly to promote the use of drugs, such as rectal artesunate, which will be suitable for the immediate management of severe malaria at home or in the community.

The proposed extension of household treatment to the management of pneumonia poses different problems. ARI case management depends for its effectiveness on the recognition among children with ARI of those 15% or fewer whose infection requires the use of antibiotics or referral. It has been well demonstrated that the two signs recommended for this – rapid respiration and lower chest indrawing – are an effective minimum and that their correct use does require both training and continued practice, which are not feasible for families and caretakers. Without this differentiation, antibiotics will be given unnecessarily to a very large number of children. The Nepal data suggest that children have between 7 and 9 episodes of ARI each year. The three most important implications of this are:

- the unnecessary exposure of the child to the risk of side effects
- the wastage of antibiotics, with its implications for economically deprived families and health services
- the risk of increasing resistance to affordable antibiotics.

In addition, although early treatment is important for children with pneumonia, there is not quite the same degree of urgency as there is for the child with malaria, and the risks are therefore less justifiable.

A hypothetical risk of the adoption of household treatment only for malaria is that, because of the large clinical overlap, the treatment of children with pneumonia may be delayed while the caretakers wait for the antimalarial treatment to work. In addition, some technical skills are needed to make best use of the treatment that is available. Bearing in mind these two points, The Meeting suggested that treatment for malaria and pneumonia should be planned together and should be made available in the community as close as possible to the household, through a health agent or worker who has received appropriate training. The need for referral for severely ill children demands that the services available at first level and referral health facilities should be developed in conjunction with the community care.

Mechanisms for implementing the concept of household treatment for malaria and/or pneumonia need to be further explored. National and/or NGO primary care programmes using community health workers are already in place in many countries. These can provide the necessary orientation and support to households and further development of household treatment strategies should be pursued in such settings.

3.2 The use of community health workers for the management of ARI, malaria and other important childhood conditions

The experiences presented in the meeting demonstrated that community health workers can provide effective and reliable care for ARI and other childhood illnesses.   Some data (e.g. Honduras, 2.3.3 above) suggest that community programmes are more cost effective than those based at other levels, but this needs to be further explored.

It was the opinion of the participants that the available evidence was strong enough that health authorities, with support from WHO, UNICEF, experienced NGOs and others, should move ahead with supporting well-monitored case management at least for childhood ARI and malaria in community health programmes using community based workers.

The evidence for the effectiveness of pneumonia management in the community plus the overlap in the clinical presentation of pneumonia and malaria require that where both malaria and pneumonia are major causes of childhood mortality they should be included together in community case management activities using community health workers.

There remain important issues to address to achieve maximum effectiveness for these programmes (see below), but most of the operational research needed for this would be best undertaken through existing operational community health programmes, including those based on IMCI, rather than as isolated special trials.

3.3 Community health workers in Community IMCI

The planning and implementation of IMCI in the community involves analysing and making full use of existing community health structures. In principle this would include ongoing case management delivered by community health workers.

The activities promoted in community IMCI normally include care seeking and the use of the local health facilities. In the light of the positive experience of the management of ARI and malaria by CHWs, the guidelines for IMCI may be modified to include steps towards training and supporting community health workers to provide clinical assessment and treatment and support of home care. WHO in the Americas and South East Asia has developed training and guidance materials on IMCI for CHWs and is supporting countries in its use. This important initiative is seen as part of a broad approach to the management of illness which includes the family, the CHW and the health facilities.

The meeting saw this as a practical way of strengthening the activities and effectiveness of IMCI. At the same time it could provide valuable opportunities in many countries to address operational questions in a working context (see below).

3.4 Achieving success with community health worker programmes.

From the experiences presented and from other programmes known to the participants, a list of issues to be considered in establishing and sustaining successful CHW programme activities was developed. The discussion on these issues led to some conclusions on possible actions and recommendations in the context of IMCI and in relation to operational research and development.

3.4.1 The policy basis for CHWs

CHWs must have concrete, clearly defined roles, functions and supporting structures. The functions must be accepted by senior decision makers, including relevant academic and training institutions and be supported within the national health policy framework. They must be authorised to provide

health care and in particular to use essential antibiotics and other medicines. Their status, including rights to payment and incentives, and their responsibilities within the health system must be clear. The responsibility of the local health authorities for their supervision and support must be defined and supported with appropriate resources. See Pakistan, 2.3.2 above.

The process of introduction of IMCI has proved to be a valuable forum for reviewing and refining national health policy for child health and for the wide involvement of institutions and decision makers. The same process may encompass the needs for the development of CHW services. WHO and UNICEF's support to countries and the development and updating of guidelines for the planning and implementation of the IMCI strategy should take account of this.

Guidance on the review of policies on essential drugs for IMCI case management should include consideration of the use by community health workers of antibiotics necessary for the treatment of pneumonia.

3.4.2 The CHW in the health system

The functions and role of the CHW need to be defined systematically in relation to the needs of the family, the responsibilities and role of the community, the capacity of the health facilities serving the community and the capacity of the health system and the community to support and supervise the CHW. The CHW should not be seen as an isolated solution to a particular health problem (such as the case management of children with malaria) but as a part of the health system's approach to the problem. See in particular Honduras, 2.3.3 above.

IMCI, working at all levels of the health system, provides child health authorities with the opportunity to take a broad view in planning services and for defining a clear and practical position for the CHW. The WHO guidelines for district planning of IMCI may be revised to include specific guidance on the use of CHWs in districts.

3.4.3 Development of case management skills

Training of CHWs should be very practical and use materials and methods tailored to their educational capacity and operational needs. As CHWs play many different roles, generic materials are likely to be of limited value, although they may provide the basis for development of suitable materials. See in particular Sudan - 2.3.4, Kenya - 2.3.5 and Nepal - 2.3.6 above.

An important task for WHO/CAH for the immediate future will be to collect and review the training materials for CHWs in use in relevant government and NGO programmes, to provide a basis for advice to countries planning to introduce or develop CHW activities. These may include one or more generic model algorithms for case management. The review should include methods

for monitoring the efficacy of CHW training, (already done in the Sudan and Nepal programmes).

3.4.4 Drugs and equipment

CHWs must be provided with adequate supplies of appropriate antibiotics, which they have been authorised to use. CHWs are not usually well accepted or effective if they cannot provide treatment. Countries in which CHWs have been given breathing timers (e.g. Honduras) have found that they are not only good clinical tools but also a useful incentive.

Community financing of essential drugs supplies, such as the Bamako Initiative, has worked well in some countries. Research is needed to define more effective and sustainable approaches to small-scale community financing for health

3.4.5 Support and supervision

Supervision is seen as being essential if CHWs are to achieve any lasting effect. It is also problematical in many places. Clear definitions of the supervisory functions are important, and health authorities must be prepared to provide adequate resources to ensure that supervision is effective (see in particular Pakistan - 2.3.2 above).

A range of methods of supervision, including the use of modern information technology, needs to be developed focusing on achieving defined supervisory functions (contact with staff, problem solving, training and follow up, outcome monitoring, administration etc) rather than just carrying out visits by supervisors. WHO, UNICEF and their partner research institutions and NGOs have an important role to play in this.

3.4.6 Links with the health facility

CHWs rarely work in isolation. More usually they are the link between the family and the community and the health facilities. They need the health facility as a referral unit and for technical and logistic support. The corollary is that the CHW is the natural focus for the outreach activities of the health facility such as immunisation, IEC and the supply of bed nets. The tasks of the CHW should be designed specifically to take advantage of this linkage, and first level health facility workers should be trained and supported to work effectively with the CHWs. See Honduras - 2.3.3 above.

Community IMCI emphasizes care seeking and the link between the community and the health facility. WHO and UNICEF can use CHW initiatives to give concrete expression to this objective. Information should be sought on the outcome for children with severe pneumonia who were referred for care

but did not attend the referral unit (The Nepal programme has such information).

3.4.7 Monitoring

It is important to both the acceptance of CHW initiatives and their long-term sustainability that suitable targets are set and monitored. Feasible indicators of quality of care, including changes in care seeking, coverage and referral are needed to allow comparison of operational approaches. See particularly Nepal – 2.3.6 above. Although mortality remains an important indicator in larger populations i.e., at country or regional level, it is extremely difficult to measure accurately, especially the cause specific mortality. Monitoring of mortality in local programme setting may not be feasible, although recording of death is valuable for local management and problem solving.

WHO and UNICEF, with research and NGO partners, may undertake a review of monitoring procedures and indicators for use at community level, including indicators suitable for use with CHWs who are undertaking case management of childhood illness. The review should also examine sentinel reporting systems useable at community level.
Small scale costing studies of community based case management may be included in wider studies of costs for IMCI and child care.

3.4.8 Orientation of the community

The CHW will operate most effectively in communities whose members understand the child health issues that the CHW is addressing and have realistic expectations of the CHW's work. The process of establishing a CHW programme should include a large element of community orientation and participation. In some circumstances the community may have a formal role in supervising the CHW. In all circumstances the health promotion activities – such as bed net distribution and use, immunisation or education on care seeking for ARI, should be participatory. The Participatory Rural Assessment methods being used for Community IMCI planning and implementation lend themselves well to achieving a high level of community awareness and participation.

3.4.9 Motivation and incentive

Some CHWs (e.g. Honduras and Nepal) are volunteers; others (e.g. Pakistan) are paid as health staff. All CHWs need some level of incentive, be it through remuneration, in-kind provision or job satisfaction. CHW programmes should not presume too much on altruism but should build in procedures and resources for providing the necessary types and levels of incentive.

The experience of health authorities and NGOs with regard to incentives should be reviewed as part of the review of CHW programme experience (see above). The review may provide guidance for health planners.

3.4.10 The experience of CHW programmes

The present meeting has been a useful opportunity to review some important community health worker programmes, but a mechanism is needed to gather and share the experience of successful programmes managed by health authorities and NGOs. WHO, with the collaboration of UNICEF and selected NGO partners should give priority to establishing this.

3.5 Summary of recommendations

Policy and management issues

1. In the light of the positive experience of the management of ARI and malaria by CHWs, WHO/CAH should revise the guidelines and training materials for IMCI to include steps towards training and supporting community health workers to provide clinical assessment and treatment and support of home care. This should make full use of the training and guidance materials on IMCI for CHWs that have been developed by WHO in the Americas and South East Asia.

2. WHO, with the collaboration of UNICEF and selected NGO partners should give priority to establishing a mechanism to gather and share the experience of successful community health worker programmes managed by health authorities and NGOs. This should include the guidance and training materials developed for CHWs.

3. The experience of health authorities and NGOs with regard to incentives should be reviewed as part of the review of CHW programme experience (see above).

4. The evidence for the effectiveness of pneumonia management in the community plus the overlap in the clinical presentation of pneumonia and malaria require that where both malaria and pneumonia are major causes of childhood mortality they should be included together in community case management activities using community health workers.

5. Mechanisms for implementing the concept of household treatment for malaria and/or pneumonia (involving assessment and treatment in the household using drugs kept in the home) need further study and documentation. National and/or NGO primary care programmes using community health workers are already in place in many countries. These programmes should be further developed to provide community case management services for malaria and/or pneumonia in close proximity to households through well-trained and supervised community health workers.   Approaches involving the assessment and treatment of childhood malaria and/or pneumonia in the home using drugs kept in the home should be considered only if approaches using community health workers fail to insure adequate access to care.

6. The process of introduction of IMCI is a valuable forum for reviewing and refining national health policy for child health and for the wide involvement of institutions and decision makers. The same process may encompass the needs for the development of CHW services. WHO and UNICEF's support to countries and the development and

updating of guidelines for the planning and implementation of the IMCI strategy should take account of this.

7. WHO and UNICEF guidance on the review of policies on essential drugs for IMCI case management should include consideration of the use by community health workers of antibiotics necessary for the treatment of pneumonia.

8. The WHO guidelines for district planning of IMCI may be revised to include specific guidance on the use of CHWs in districts.

Operations research

WHO and UNICEF, working with their research partners and NGOs, should promote operations research on the following topics. Wherever possible, the research should be undertaken in the context of existing operational community health programmes, including those based on IMCI, rather than as isolated special trials.

1. The definition of more effective and sustainable approaches to small-scale community financing for health, including community drugs supplies.

2. The development of a range of methods of supervision, including the use of modern information technology, focusing on achieving defined supervisory functions (contact with staff, problem solving, training and follow up, outcome monitoring, administration etc).

3. Monitoring procedures and indicators for use at community level, including indicators suitable for use with CHWs who are undertaking case management of childhood illness. The review should also examine sentinel reporting systems useable at community level.

4. Small scale costing studies of community based case management. These may be included in wider studies of costs for IMCI and child care.

Outstanding clinical research issues

1. WHO should promote further research to define more effective ways of managing children affected by the overlap of malaria and pneumonia, including practical clinical approaches to separating the two conditions.

2. Information should be sought on the clinical outcome for children with severe pneumonia who were referred for care but did not attend the referral unit (The Nepal programme has such information).

3.6 The next steps

This meeting provided a useful glimpse into the potential of the CHW as an agent of case management and education for ARI, malaria and other childhood illness. The meeting proposed the following next steps:

1. The outcome of the meeting should be disseminated in document form and used in discussions on ARI, IMCI and malaria by WHO, UNICEF and its partners, including the major NGOs concerned.

2. WHO and UNICEF with their partners should plan as soon as possible to undertake a review of the global experience of community care for ARI, malaria and other major child health problems. They should use the results of this review to advocate with stakeholders and governments for wider use of community case management and more resources.

3. In the light of the information from the review, WHO should organise an examination of the needs, opportunities and priorities for operational research on aspects of community care for pneumonia and malaria.

4. National Health authorities, with the support of WHO, UNICEF, experienced NGOs and others, should move ahead with supporting well monitored case management, at least for ARI and malaria, in the community, making use of community health workers

5. The present meeting has been a useful opportunity to review some important community health worker programmes, but a mechanism is needed to gather and share the experience of successful programmes managed by health authorities and NGOs. WHO, with the collaboration of UNICEF and selected NGO partners should give priority to establishing this.

6. UNICEF is developing child survival/IMCI activities in Senegal, Mali, Benin and Ghana. The use of antibiotics by health workers for the management of pneumonia has been proposed. A small *ad hoc* working group including UNICEF, USAID, WHO, Johns Hopkins University and the Karolinska Institute plans to explore this as soon as possible after the Meeting.

Annex 1

<center>AGENDA</center>

<center>**EVIDENCE BASE FOR COMMUNITY MANAGEMENT OF ACUTE RESPIRATORY INFECTIONS (ARI)**
JUNE 11-12 2002
STOCKHOLM, SWEDEN</center>

Tuesday, June 11, 2002

9.00-9.15	Opening remarks	Anders Nordström
9.15-9.30	Introductions, objectives of the meeting; overview of the agenda	Hans Troedsson

OBJECTIVE 1: Review of the management of acute respiratory infections (ARI) in children.

Chair   Hans Troedsson

9.30-10.10	Management of children with ARI: Public Health perspective	S. Qazi/S. Aboubaker
10.01-10.30	Discussion	
10.30-10.45	Coffee/Tea break	

OBJECTIVE 2: Review evidence concerning community management of ARI: Research

Chair   Al Bartlett

10.45-11.15	Management of children with ARI: Familiesperspective	Gretel Pelto
11.15-11.45	A meta-analysis of evidence of standard case management for ARI at community level	
		Bob Black
11.45-12.05	Symptom overlap of malaria and pneumonia	Stefan Peterson/ Karin Kallander/ Jesca Nsungwa-Sibiti
12.05-12.45	Experience from Uganda	Betty Mpeka
12.45-1.15	Discussion	
1.15-2.15	Lunch Break	
2.15-2.45	Antimicrobial use/misuse for ARI	Kathy Holloway

OBJECTIVE 3: Review evidence concerning community management of ARI: Programme experience

Chair   Genevieve Begkoyian

2.45-3.15	Programme experience: Pakistan
3.30-3.45	Coffee/Tea break
3.45-4.15	Programme experience: Honduras
4.15-5.00	Discussion

Day 2   Wednesday, 12 June 2002

OBJECTIVE 3 (Cont'd):

Chair   **Kathy Holloway**

9.00-9.30   Programme experience: Sudan

9.30-10.00   Programme experience: Kenya

10.00-10.30   Programme experience: Nepal

10.30-11.00   Coffee/Tea break

11.00-1.00   General Discussion

1.00-2.00   Lunch

OBJECTIVE 4: Identify gaps in knowledge and make recommendations for addressing the gaps in knowledge (e.g., research etc.) and management of ARI in the community

Chair   **Robert Black**

2.00-3.00   Identify research gaps and ways to address them

3.00-4.00   Way forward with management of ARI in the community

4.00-5.00   Summary, conclusions and recommendations

Annex 2

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