6 Acute Respiratory Infections

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Around two million child deaths each year are caused by Acute Respiratory Infections (ARI)—primarily pneumonia. ARIs are responsible for one-fifth of child mortality worldwide, making it the biggest single killer of children.[1] Mortality is especially high in the first six months of life. This makes it an important area of overlap with newborn health. Acute ARIs are also involved in a large proportion of deaths due to measles and HIV/AIDS.[2] Throughout the last decade, deaths due to ARI remained constant or even rose in parts of both Asia and Africa.

Every child typically experiences four to seven bouts of ARI each year, many of them mild or moderate.[3] Immunization against pertussis and measles protect against some serious infections.[4] Exclusive breastfeeding is especially important in the first six months to protect young infants who are most vulnerable. Environmental and hygiene practices also

1 Black et al. 2003; WHO/UNICEF 2004; Bryce et al. 2005.

2 Victora et al. 1999.

3 Mortality is caused by Acute Lower Respiratory Infections (ALRI), primarily bacterial pneumonia and also meningitis. Mild and moderate upper respiratory infections include coughs and colds.

4 The introduction of vaccines against *H. influenzae* type b (Hib) and pneumococcus will also prevent deaths.

play important roles. A recent study associates handwashing with a potential reduction in ARI incidence of around 47 percent.[5] The relationship between indoor smoke (especially from cooking stoves) and ARI is also being studied.

A CARESEEKING AND CAREGIVING INTERVENTION

However, effective interventions to control ARI focus overwhelmingly on *management of sick children* with antibiotics. The family must recognize symptoms and respond quickly to assure appropriate treatment. A child not treated can die within two to four days.[6]

Many behavioral issues are similar to those for malaria case management. Home treatment requires knowledge of specific symptoms, prompt action, compliance with a drug regimen, and proper care. *Access to drugs* and to appropriate counseling are critical. Important underlying factors therefore include *community preferences* regarding both treatment and providers. As with malaria, the training given to specific providers, their communication skills, as well as the packaging of drugs and the provision of various support materials, are large factors in "compliance." Community-health system linkages, especially to support community providers and referral of severe cases, are also key.

At the same time, ARI interventions have had a very different history, and enjoyed a different status from malaria control efforts. One reason is the overlap between the symptoms of these two diseases—and often of the diseases themselves. In malaria endemic areas, children with fever are "presumed" to have malaria. Many of these children also (or only) have ARI, however. And community workers trained to assess malaria are rarely trained to look for symptoms of ARI. A child brought to the health center should be assessed for both conditions, under the IMCI protocol.

One reason for the emphasis on treatment of malaria and de-emphasis on ARI at the community level despite the high mortality from ARI, is the fact that children in malaria endemic areas may have three episodes of malaria for every one of ARI—making the likelihood of malaria seem more urgent.[7] Another reason for lack of attention to ARI is the fact that malaria has remained a vertical program (attracting both focus and funding) while ARI has not. Yet another is that ARI symptoms are in some ways harder to identify and assess.

THE VERY SHORT HISTORY OF ARI

The challenges surrounding ARI symptom definition and recognition slowed the processes of developing a clear algorithm, identifying "key practices," and launching programs. ARI first emerged as a feasible intervention in the early 1980s when WHO developed a protocol for first-level care facilities. Pilot community-based programs followed. In 1992, the Lancet published a groundbreaking meta-analysis showing the feasibility and effectiveness of programs conducted by *community-based workers*. Around the same time, WHO published a series of training manuals including a course for community health workers.

However, in 1995, just as some of the first national programs were taking off, donors shifted their attention to IMCI and to *facility-based training*. Most community-based ARI activities lost their funding and many disappeared.

5 Luby et al. 2004.

6 USAID 2004.

7 WHO 2002.

In just the last few years, ARI has started to generate new interest. In 2003, the Lancet published a second meta-analysis of the successful early community-based programs—showing that these interventions reduced pneumonia-related deaths by 36-42 percent and overall child mortality by 20-27 percent, with most deaths prevented among those who are youngest.[8] In the same year, WHO and UNICEF drafted a joint statement supporting programs at the community level, recommending distribution of antibiotics by community workers and integration with malaria efforts.[9]

These two documents are essential seeds for renewed *advocacy*—providing both the evidence base and the international "call" for programs. However, national and district-level *data* regarding ARI mortality should constitute the most powerful argument to policymakers that they should give substantially more attention to ARI.

PROMOTING POLICIES, ADVOCATING FOR PROGRAMS

Emphasis on the Community

The draft WHO/UNICEF statement identifies three strategies for improving quality of care and access to both care and drugs:

- Improving accessibility and quality of care for children with ARI at *first-level facilities*
- Improving quality of care in the *private sector* (especially in urban areas)
- Increasing accessibility of well-trained *community health workers* who can administer antibiotics and counsel parents

Behavior change and communication strategies have strong roles to play in supporting, or introducing activities, in all three areas.

Most work to date has been focused on first-level care facilities. Community and provider *links* with these facilities are important for all three strategies. Severe cases must be *referred* through the health system, and health system *support* is crucial to any program that supplies drugs in the community. These are familiar themes from several other child survival interventions already discussed. As for malaria and CDD however, reducing mortality will require bringing treatment closer to the home.

Timely access to antibiotics and to skilled care is central to preventing deaths. The joint statement recommends designing programs that support the role of *community health workers* to identify and treat pneumonia with antibiotics. It emphasizes the importance of adequate *training* and *supervision*, the need for strengthening the drug supply system, and the importance of *partnering* with nongovernmental and community-based organizations to recruit and train CHWs and monitor their ARI-related performance. Such programs are now non-existent in many countries.

Although the joint statement recommends working with *private practitioners* to improve ARI treatment, it also points out the current lack of evidence for effective approaches. In comparison to both malaria and diarrheal disease, we know little about the ARI prescribing practices of private providers and how to improve them. This is another crucial area for work. An important first step is formative research about community careseeking to understand where families actually go for both treatment and advice. Since 50-90 percent of antibiotics are provided by the private sector, interventions with drug sellers, for

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8 Sazawal and Black 2003.

9 WHO/UNICEF 2004 (draft).

GOING TO SCALE WITH A COMMUNITY-BASED PROGRAM NEPAL

In Nepal, a community-based ARI intervention was nurtured from a demonstration pilot to a 14-district program supported by multiple NGOs and incorporated in the Ministry's regular supervision system.

First provide evidence Small controlled pilots (managed by John Snow International and the Mrigendra Medical Trust) first demonstrated that Female Community Health Volunteers (FCHVs) could be trained to detect and treat ARI in areas with poor access to services. The initial pilot, which began in 1987, led to a 28 percent reduction in the risk of death from all causes by the third year of services.

The program tested two models One model provided FCHVs with antibiotics to dispense to parents. In the other, FCHVs gave parents referral slips—but no drugs—for children who needed treatment. An evaluation in 1997 showed that in both models, total case management was correct for 80 percent of children. FCHVs were also successful in determining severity; 93 percent of cases were assessed correctly. However, in the referral group, only 25 percent of referred children were actually taken by parents to the facilities. These data provided stakeholders with evidence that the *treatment model* was effective and preferable in this setting.

Scaling up The first phase of expansion was handled through NGOs. Seven additional districts were added with the help of four international NGO partners. The training program includes a half-day orientation for local leaders and a one-day orientation for mothers' groups. The original IMCI training for health workers was revised to include two days of training on how to supervise FCHVs. This addition of a supervisory link has integrated the ARI program into the regular ministry system. The program has now expanded to 14 districts.

Expanding to private providers Because many families consult traditional healers for treatment of pneumonia, the MOH collaborated in orienting traditional healers from six districts to recognize signs of severity for ARI and diarrhea. After training, 96 percent of the healers said they referred ARI cases to health facilities, whereas beforehand only 35 percent said they had referred.

Source: Dawson 1998; Houston 2001.

example, are likely to be central to rational drug use.[10]

A number of countries are carrying out pilots and scaling up programs with private practitioners, and planners should watch for the results—both to learn from their lessons and gather evidence for advocacy efforts. Efforts to improve the ARI-related prescribing practices of shopkeepers may or may not be linked to a focus on malaria-related practices.[11] In Nepal, traditional healers have been trained to recognize ARI and counsel families (see box at left).

Attacking ARI at the community level requires a major new effort in many countries, much as the launching of newborn programs does. As for newborn care, a comprehensive strategy might include a phased approach focusing on both *home behaviors* and the *practices* of different *providers*. Depending upon the endemicity of malaria, reducing ARI mortality also requires explicit steps to integrate strategies for the two diseases at the community level (see also page 122).

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10 WHO 2002.

11 See for example Tawfik et al. (unpublished)

Advocacy for New Programs and Protocols

Advocacy for new policies and programs is a crucial first step. These efforts must be careful and very strategic in a way that advocacy for newborn programs, for example, may not have to be due to the role of antibiotics. Ministries of health are rightly hesitant to allow minimally trained providers to prescribe and dispense antibiotics. Moreover, cotrimoxazole, (the first-line treatment in most countries) is taken for five days, making drug compliance particularly challenging.

Stakeholder consensus must be cultivated even for pilot programs. History has shown that ministry involvement and support (even following a well-demonstrated success story), cannot be taken for granted. In the past, designers of at least one small ARI program (who were outside the MOH but hoped their program would be scaled up) mistakenly thought the ministry would appreciate a successful independent trial.[12] Concerns about drug resistance are even more acute than in those early days. Moreover, ministry ambivalence may persist beyond initial program approval. In Malawi, for example, the government at first allowed CHWs to dispense antibiotics and then rescinded its policy.[13]

Short-term donor- or NGO-driven community programs that operate without the full confidence of the health system are likely to fail for several reasons. Community-based programs create a burden on the health system and must be embraced by them in order to succeed. Community workers need *good linkages* with facilities if supervision systems are to operate at scale. These relations must be fostered early. An initial communication plan should include discussions of ARI morbidity and mortality data with lower levels of the health system, in order to demonstrate how CHWs can actually reduce the workload on facilities and save lives.

Monitoring of community-based ARI interventions is particularly important to provide evidence of rational drug use by both providers and families. This evidence is essential for reassuring policymakers and for identifying problems (as well as best practices) for scaling up. Sharing of data on an ongoing basis allows for a *continuing* process of communication with stakeholders at various level and builds the trust needed for effective advocacy.

Pilot programs are necessary to test approaches. However, some of the early pilots were too labor- or cost-intensive to be run at a large scale. Another challenge is the need to integrate effectively with community programs already on the ground.

The UNICEF/WHO statement recommends building ARI programs on existing structures—in other words, integrating with malaria and diarrheal disease, and to some extent newborn programs. Nevertheless, new programs will require mobilizing resources, adapting and simplifying ARI algorithms, introducing new training and supervision programs, and supporting drug supply systems.[14] Behavior change and communication experts have a particularly important contribution to make in assuring training programs and materials, as well as assessment/treatment algorithms, are culturally appropriate and effective with low literate groups.

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12 René Salgado, personal communication.

13 Gilroy et al. 2004 (draft).

14 Designing and maintaining drug supply systems for community-based programs is a complex challenge not discussed in this document.

RECOGNIZING ARI —THE FUNDAMENTALS

Not Just a Cough or Cold, Not Just a Fever

For both families and providers, *recognizing* children who need ARI treatment is the fundamental challenge.

A common early "warning sign" for ARI is a cough. Most children with coughs don't need antibiotics, however. A child who needs antibiotics is distinguished by having *difficult or fast breathing*. A child with *severe ARI* may also suffer from noticeable "in-drawing" of the chest.

Agreement on "fast breathing" as the clinical sign of severe ARI and the right trigger for urgent care was a major step in the 1980s. Research showed that first-level care providers and also community volunteers and parents could learn to recognize this as a danger sign.[15] Providers may need to use a watch or a timer, and follow an algorithm with cut-offs for different ages. Parents can often recognize abnormally fast breathing in their children without counting breaths. They do not always understand the seriousness of this symptom though.

Cough is easy to recognize and is a useful sign (or cue) to use as a warning to parents that they should be alert, and to providers that they should count respirations. *Chest in-drawing* is more difficult to recognize and to describe. It is also a sign of severe illness. So communication with parents emphasizes the earliest sign of pneumonia: *fast or difficult breathing.*

KEY BEHAVIORS FOR ARI CARESEEKING AND MANAGEMENT

The child with ARI depends upon both the family and the provider to act quickly. Good care also depends on the ability of parent and provider to communicate well. Key practices include:

Parent seeks care
- Parent brings a child with cough or fast breathing to trained provider without delay.

Provider treats and counsels
- Counts respirations, checks for fast breathing
- Checks for chest in-drawing (refers if appropriate)
- Gives drugs as appropriate
- Advises mother:
  - how to give antibiotics
  - how to recognize danger signs
  - how to care for the child at home

Parent gives care at home ("compliance")
- Gives the full dose of antibiotics
- Watches for danger signs and returns if:
  - child has fast breathing
  - child has chest in-drawing
  - child is not able to eat or drink
- Breastfeeds frequently (if an infant)
- Keeps young infant warm
- Offers extra fluids
- Feeds more frequently
- Clears child's nose if it interferes with feeding

This child may have pneumonia
- breathing becomes difficult
- breathing becomes fast
- child is not able to drink
- child becomes sicker

Source: WHO 1999.

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15 Sazawal & Black 2003.

Family Behaviors, Provider Behaviors

As with malaria and diarrheal disease, proper care includes a series of steps by both family *and* provider. Protecting the child requires that both carry out key behaviors (see box page 112). The basic clusters of behaviors are:

- Parent acts quickly when child shows danger signs and seeks skilled care
- Provider assesses the child and classifies the illness correctly
- Provider counsels on how to administer the antibiotics and demonstrates how; (depending upon the policy for drugs and referrals, the provider may give the child a first dose of antibiotic and either give the remaining five days' doses for later, or tell the family how to purchase these)
- Provider counsels on danger signs (and when to return if treatment fails or the child worsens)
- Provider counsels on home management (including feeding during and after illness)
- Parent gives appropriate care

Although the parents' behaviors are encompassed by just two steps here, these are really complex clusters of behaviors: *careseeking* and *compliance with advice*. There is little time to act at many points in this series of steps, and many potential weak links in the ideal practices. The weakest links will vary from community to community and according to how the program is designed. Major behavioral challenges are likely to fall into a number of categories:

Symptom Recognition and Interpretation

Symptom recognition and interpretation is a challenge in all programs. In fact, many ARI programs to date have not relied on parents to recognize signs of ARI. Instead, they have focused on "active case-seeking" by CHWs to identify children who need treatment. This may be easier in the short term than creating a new *careseeking norm* for a symptom that is likely to require *translation* from one set of health beliefs and disease concepts to quite a different one (see discussion beginning page 114).

Delay in Seeking Help

Delay is life-threatening and can be caused by several factors beyond those of symptom recognition. The family may understand that the child is in danger but go to various local providers. Serial careseeking is common for ARI. Or one parent may understand that the child needs allopathic (western medical) treatment, but family decision-making may be slow. (Any decision involving use of money is likely to require involvement by a male family member, for example.) The *age of the child* may be a factor. Many families will not take an infant out of the house for treatment, and this age group is hardest hit by ARI.

Access to Providers and Quality of Treatment

The family must know where the provider is located, have reasonable access, and believe the provider can provide the right treatment. The provider in turn must carry out assessment, symptom classification, proper treatment (and/or referral), and counseling. Responsibilities may also involve actually dispensing drugs. Good training and supervision are crucial in community-based programs (see page 120).

Provider Prescriptions and Parental Compliance

Provider prescriptions and parental compliance are always focal points for concern. Compliance with a drug regimen requires easy access to affordable drugs, good counseling, and appreciation of the importance of *completing the dose*. Many of these issues are similar to those for malaria. In some ARI programs, providers

visit the home and administer drugs. Access and cost issues, in addition to knowledge of correct practices, are key variables in giving a child the *right antibiotic,* in the *right dose,* for the *full duration*.

Treatment and/or Referral of Severe Cases

Counseling on signs of severity (chest in-drawing) and recognition of this sign are almost always weak links. Similarly, both the provider and the parent may face barriers to referral when a child has severe ARI. Families face the familiar costs of transportation and time. They may also have little confidence in the referral facility (see box page 116). For the provider, barriers may begin with lack of skills or confidence in recognizing symptoms of severity. Lack of confidence often goes hand in hand with poor links to the referral facility, and even fear of health system reprisal if a child is referred unnecessarily.

Formative research can help uncover, and monitoring should help track, the potential "weakest links" in the series of ideal steps.

Keeping What's Important in Perspective

Counseling on Feeding

Many children who have moderate or severe ARI are underweight and undernourished and most are very young. Continued feeding of a child with ARI is very important and can be more difficult if the child's nose is clogged. Breastfeeding may pose a special problem. Counseling on feeding is therefore crucial. However, as with both diarrhea and malaria, providers are likely to short-change or ignore feeding messages.

Counseling for Mild Cases

All children with ARI have trouble breathing and this may be equally noticeable in mild and moderate cases if the child's nose is blocked/clogged. However, focusing on the cold has been a dangerous distraction in the past. Before WHO pinpointed the importance of fast breathing, programs over-emphasized treatment of minor symptoms. The previous version of *Facts for Life* also drew attention to minor symptoms, and many programs still rely on this old resource. USAID programs in recent memory conducted research on how parents blow their children's noses and even distributed hankies with program logos on them, ostensibly to raise awareness about ARI. Many community programs may still be misdirecting parents' attention.

Expectations for Mild ARI

If a mother brings her child to a provider for treatment, she typically hopes for the promise of an injection or a medicine. Although drugs are not appropriate for mild or moderate ARI, the average mother will not be satisfied just to learn about danger signs and how to feed her child. If she is worried, she will simply go to another provider in order to get some kind of treatment. The initial provider may also lose credibility in her eyes. Cough and cold remedies can be very important from a mother's point of view, and providers realize this. Some will prescribe something harmless to satisfy a parent's need for "medicine" and to retain their trust. Formative research in this area should discriminate among harmful and harmless remedies, and whether primary messages receive attention.

Naming the (Right) Symptoms, Treating the (Right) Disease

Relative to many other child survival interventions, we know comparatively little about how communities perceive important symptoms of ARI, what signs they do associate with pneumonia, and what treatments and

providers they prefer. Beliefs and behaviors may also vary for different ethnic groups in a single area.

For communication programs, these signs are also much more challenging than, for example, the symptom of malaria—*fever.* A "hot body" may be attributed to different causes, but is generally recognized by most cultures. The co-occurrence of fever and fast breathing is another problem. Parents may be used to watching a fever for a few days to see if it gets worse. This can be fatal if the fever is due to ARI.

The sign of true severity for ARI is challenging. *Chest in-drawing* has no familiar label even in western languages and is not as dramatic as convulsion a sign of severe malaria, for example. In some cultures, this movement of the lower chest is even attributed to a stomach ailment rather than to breathing. Finally, parents have not been trained to associate any of these signs consistently with any "western" disease (as, for example, they associate fever with malaria). And they may already be associating the sign with another western term—"asthma," for example. This will further complicate communication.

An underlying task for all ARI interventions is therefore to create community awareness of specific signs and the need for fast action. The condition also needs a recognized name, or a branding process. A parallel task is to understand the terms families do use, so that providers know how to ask questions, can interpret what they hear, and can give relevant advice. Both of these tasks are crucial behavioral research challenges.

COMMUNITY PERCEPTIONS AND RELEVANT PROGRAMS

Using The "FES"

ARI programs require a translation process between what communities notice and what the health system would like them to notice. Ethnographic research is

FOR ARI, THE LANGUAGE IS THE MESSAGE

Research in several countries has helped uncover *common terms* and *concepts of illness* associated with ARI by given populations; using these terms during counseling also helps providers give *advice* that speaks to current practice.

Viet Nam Researchers investigated local concepts for the problem of "fast breathing" and found parents commonly used terms that translated closer to "strong or tired breathing." When new messages were pretested, only 12 percent of mothers were able to recall instructions when the message used a direct translation of "fast breathing;" 27 percent recalled the message when the local terms were used.

Ghana Materials included specific advice about feeding such as "Give more fluids such as ZOMKO and increase breastfeeding." Since mothers were concerned about cough, home treatment also emphasized a *nutritious* remedy: "Soothe the throat and relieve the cough with herbal infusions mixed with peanut butter." Messages also warned against specific harmful practices: "Do not give your child Rubb or Chinese Rubb mixed with water to drink."

Pakistan Research revealed that among certain ethnic groups in the Northwest Provinces opium is a traditional remedy for suppressing coughs. This masks symptoms and can be dangerous to a child (and especially an infant). Program messages discouraged this remedy.

Sources: WHO 1999; WHO 1995.

often a necessary part of formative research for ARI. WHO has developed a focused ethnographic assessment tool (FES) that can be completed in six weeks.[16] It helps investigate social and cultural aspects of ARI household management: signs parents commonly associate with pneumonia, the terms they use to describe these and the concepts behind them; how they perceive severity; and home treatments that have both positive and negative consequences.

The FES also looks at aspects of careseeking: when parents decide to go for help; who makes this decision; whom they consult, and in what order. As with malaria and diarrheal disease, behavioral research should look at the practices of both *parents* and community *practitioners*. The FES includes methods for interviewing pharmacists about theoretical cases in order to understand their prescription practices, for example.

Videotapes of children with specific symptoms have been invaluable in community ARI research to elicit parents' terms and treatment practices.

Feeding Behavioral Research into Programs

Planners should use the results of research to help design or refine both *communication strategies* and *training programs*. Communication experts can help incorporate local terms and concepts into:

- Messages for communities about when to seek care
- Training materials for health workers (e.g., case examples and role plays) using symptoms and careseeking patterns commonly described by parents

FERTILE GROUND FOR FORMATIVE RESEARCH

The FES provides guidelines for investigating a number of critical questions in addition to the *terms* families use to describe symptoms of ARI and *the disease concepts* they associate with them. Among these other critical questions are:

ARI household management Who takes care of the child with ARI? What are feeding practices? What home remedies are used? Do families purchase antibiotics? What are mothers told by drug sellers about drug treatment? How is home treatment of a young infant different from that of an older child?

Careseeking Who decides when a sick child needs treatment outside the home? Who decides which practitioner to use? Who takes the child? What is the sequence and timing of careseeking? How does this vary by perceived severity of illness and age of child? What are the most common reasons for delay (for example, going to a particular provider first, or concern about the need to pay for drugs)?

Family expectations When do mothers consider a medication has failed and another treatment is necessary? When do mothers stop giving a medication? (e.g., Do they complete a course of antibiotics or only give it until the child is better?) What do mothers expect when they seek care for a child with ARI? How rapidly do they expect improvement? What other factors influence compliance with medication? What are the factors that influence when a mother will return or go to a health center if a child's condition worsens?

Communication What are maternal expectations regarding cough and cold remedies? How important is it to give a remedy in a clinic visit?

Source: WHO 1995.

16 WHO 1995.

- Face-to-face counseling (especially regarding signs of severity)
- Adaptation of household morbidity and treatment surveys

Local practices should also provide the basis for modifying the IMCI generic case management/ treatment "box." Counseling requirements may seem straightforward: the provider should counsel the parent about *signs of severity*, about how to give the child *antibiotics*, and how to care for the child at home (including *feeding advice*). But instructions about home care in particular can be adapted[17] so that:

- Advice is phrased in *local terms* (using common names for signs)
- Superfluous advice is deleted (any practice that is already a local norm)
- *Related illnesses* that the community typically seeks help for elsewhere (e.g., from a traditional healer) are specifically mentioned
- Local practices that are *helpful* are reinforced
- Warnings are given against common *harmful* practices

ELEMENTS OF COMMUNITY-LEVEL PROGRAMS

Introducing "the Disease" and the Service

Bringing services to those who are most vulnerable requires *strong preparation* at the community level. Communication approaches can strengthen several aspects of community introduction. Strategies include:

- Creating strong links with, and buy-in from, the local *health system* in order to support supervision and referral
- Engaging *community leaders* to raise awareness of ARI mortality, symptoms, and services
- Designing activities with *local networks* (such as women's groups) to promote awareness of services and knowledge of ARI symptoms
- Working with *community members* to design messages and materials that will improve knowledge and promote use of services
- Designing strategies to *motivate* CHW involvement over time

A successful ARI program in Nepal incorporated a strong educational component into existing women's groups activities. The local community volunteer visited the groups personally and used tailored materials to help explain the new service as well as the signs and symptoms of ARI. Like all community-based programs, workers are more apt to be trusted if they are from the community. This is particularly true for services focusing on very young children. In India, for example, program planners found that rural communities had more confidence in TBAs with no education at all than in paramedics who lived outside the area and visited infrequently (see box page 118).

Promoting a new service is easier than introducing a new worker. An integrated ARI, malaria, and CDD program in Kenya spent most of its initial efforts training a new cadre of CHWs in their counseling/treatment practices and failed to adequately introduce the workers themselves. Although each CHW was responsible for just eight to ten families, after two years of implementation, community awareness was still not satisfactory. Among parents whose children had died and had *not* sought help from a CHW, 26 percent said they were not aware of the worker.[18] As always, communication planners must

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17 WHO 1995.

18 Gilroy et al. 2004 (draft).

find ways to both call attention to and celebrate *CHW contributions*.

Drugs, Messages, and Target Audiences

Many of the central issues surrounding ARI concern the antibiotics themselves: *where* they are available, *how reliable* the supply is, and what they *cost.* The importance of different *audiences* changes according to the program model. If families have to pay for drugs, messages should include male decision-makers. In one African country, consistent cost information was not disseminated aggressively enough to the community; CHWs felt obliged to give their drugs out free and incurred large debts.[19]

Messages about compliance will also vary depending on the source of drugs. If drugs are only available from a community provider, dosage information and the importance of completing the dose can be stressed in *counseling*. If drugs for ARI are often acquired elsewhere in the community, or if families have to buy drugs, barriers to compliance may be complex. Audiences and message strategies must be tailored to local careseeking practices. *Appropriate prescribing information* should ideally be targeted to all popular practitioners or drug sellers. As mentioned earlier, this is an important area for research. Minimum communication aids include simple dosage instruction charts and key message reminders, especially to ask about danger signs and refer if appropriate.

Strategies for Infants and Neonates

Careseeking is often different for children under one and particularly for newborns. Specific messages, and often intervention strategies, are needed to promote care for those most vulnerable. The highest proportion of deaths are among the youngest children, who are least likely to be taken from the home even when seriously ill. Nevertheless, some of the highest mortality reduction in community-based programs has been among the youngest children—including neonates.[20] Several Asian countries—in particular Bangladesh and India—have developed effective programs that focused on *case-seeking* and trained local TBAs to assess and treat infants in the home[21] (see box page 119). Messages about danger signs for ARI must also be tailored for this age: non-specific danger signs such as not feeding or feeding poorly should prompt families to seek help urgently.[22]

PRACTICAL, SKILL-BASED TRAINING AND SUPERVISION

Both the *clinical* and the *communication* skills of providers are key factors in saving lives. Training programs for facility-based as well as community health workers (CHWs) must be competency based, behavior based—involving modeling of behavior and role playing—and practical. Training cannot be limited to the classroom. Providers need supervised practice assessing children, deciding how to treat them, counseling parents, and filling out record forms.

Observation of real cases is important for ARI. Many programs have used videos of children with

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19 CARE 2003.

20 Sazawal and Black, 2003, report a summary effect of 27 percent on neonatal mortality.

21 WHO has not approved cotrimoxazole for newborns. However, pilots have used the drug apparently without harm. *All* pilot programs need to collaborate with and be supported by different levels of the health system, particularly because of the sensitive issues regarding drug use. (René Salgado, personal communication.)

22 USAID 2004.

TRAINING TBAs TO TREAT THE MOST VULNERABLE

In Gadchiroli, India, a community-based ARI program carried out by the Indian NGO, SEARCH, initially recruited paraprofessionals—female village health workers and male drug dispensers. However, because the highest ARI mortality was among neonates, a pilot was launched to test whether TBAs could diagnose and manage ARI in the home.

Designing a program for non-literate providers The TBAs had no formal education. Many could not count higher than 12. However, they traditionally have access to neonates whereas the other workers do not, and families trust them almost as much as the highly trained village health workers.

Special materials and a unique training program were developed for the group consisting of six sessions of 90 minutes each. The TBAs were trained in an informal group setting using games, role plays, and pictorial aids illustrating correct antibiotic doses. They used mnemonic chants to help memorize doses. A videotape taught how to count respiratory rates and recognize chest in-drawing. The training was a strong emotional experience for them, allowing them to associate freely with colleagues in a supportive setting. They received no honorarium or incentives.

Although the TBAs could not count respirations in the usual way (which requires counting up to at least 60), they gained good visual judgment of symptoms. In the first year, supervision monitoring showed they correctly diagnosed 59 percent of cases.

Improvements with a tailored "timer" To improve their ability to assess symptoms, the program invented a device that "counted" for them. It consisted of a one-minute sand-timer and an abacus with two rows of beads: one for infants up to 2 months, one for those 2 to 11 months. After counting each group of 10 breaths, the TBA was to move one bead on the appropriate scale. The beads thus provided visual evidence of whether infants had "fast breathing." After the breath counter was introduced, correct diagnoses rose to 82 percent.

Results By 1991, after three-and-a half years of intervention, mortality due to pneumonia among neonates had declined by 44 percent. Total neonatal mortality fell by 20 percent. Community acceptance of the program was high. TBAs were also the only community-based workers in almost half of the villages. The evaluation also noted that tremendous effort is required by the health system to work productively with TBAs because of their low educational and social status.

Source: Bang 1994.

different symptoms to teach the signs of ARI and to demonstrate how to count respiratory rates. The videos used for ethnographic research can also be used in training.[23] In Bangladesh, trainers/supervisors initially accompanied community workers to the field so they could demonstrate actual case management.

ARI assessment requires specific skills and confidence in performing them. The cornerstone is counting respiratory rates and classifying symptoms according to the child's age.[24] Fast breathing is harder

23 WHO 1992.

24 WHO 1991. Respiration cut-off rates for ARI are: 60 breaths per minute for children under two months; 50 breaths per minute for infants 2-11 months; and 40 for children 1-4 years.

to recognize in malnourished children, who may not have the strength to breathe harder.[25] Programs described in the Lancet study mentioned in the beginning of this chapter, as well as more recent interventions, have demonstrated that low literate volunteers can learn these skills.[26] But training must be adapted to the educational level of the learners and other aspects of the local context.

The high dropout rate typical of many CHW programs, combined with the complexity of ARI treatment skills, make both *supervision* and *refresher training* particularly important. An added problem is that workers who have small catchment areas (and don't see frequent cases) simply lose diagnostic skills. In Papua New Guinea, only 63 percent of CHWs maintained competency one to four years after training. This was attributed largely to lack of opportunities to practice.[27] In Kenya, refresher training was conducted at a district hospital so CHWs could see cases.

A number of programs have found that CHWs have most difficulty assessing severe cases.[28] Children with chest in-drawing may not be referred. This may even be reflected in CHW records. The reasons for non-referrals should always be analyzed. One program found that CHWs were reluctant to refer children because they were afraid of criticism by the health facilities if a diagnosis was incorrect. Poor skills, and poor relations, require different supportive strategies.

MATERIALS AND THE MARVELOUS TIMERS

ARI requires unique materials for both parents and providers. Generic materials created by donors will have limited use at the local level. The basic algorithm needs to be adapted to the local terms and also to the abilities of the users. Communication experts can help design simple flow charts to help providers classify signs and symptoms, and recommend and record drug dosages. Counseling cards with carefully pretested pictures of specific symptoms, explained with terms used by the community, have proven useful in several programs.

Counting respirations is possible with a watch. In the 1980s, UNICEF created a simple timer used in some of the early ARI programs. Recent programs have also used timers. A timer helps the provider determine cut-off rates for fast breathing. It increases the confidence of both providers and families. It also bestows status on the owner. In both Honduras and Nepal, timers were perceived by CHWs as rewards, and by communities as evidence of their skills.

The program in India working with TBAs developed a special mechanical timer for them since many could not count higher than 12. Although TBAs were actually able to recognize fast breathing in infants fairly accurately since they were accustomed to this age group they did better when the counters were introduced (see box page 121).

SUPERVISION

Monitoring Performance

Supervision has played an important role in the most effective programs. The type of supervision conducted may be as important as the frequency. In Honduras, community workers were visited only three times a

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25 Pio 2003.

26 Sazawal and Black 2003.

27 Gilroy et al. 2004. (draft)

28 WHO 1999.

GOOD SUPERVISION ALLOWS FOR DROPOUTS AND CATCH-UP

The Bangladesh Rural Advance Committee (BRAC) launched a pilot community-based ARI program in 1992 with CHWs who had about five years of education. By January of 1999, the program had expanded to 2,500 volunteers, each serving 100-120 families.

Uneven recruitment Some early problems with dropouts meant that only about 57 percent of CHWs received the original three-day basic training. The program provided a day of refresher training once a month for the first three months to bring new recruits up to speed quickly. Supervision by BRAC paraprofessionals played a particularly important role.

Results Supervisors were expected to visit CHWs once a month and discuss problems. In fact supervision improved the accuracy of CHW performance more than four-fold over the course of the pilot period. An evaluation in 1999 showed that CHWs diagnosed 89 percent of cases accurately and provided correct treatment 87.2 percent of the time. Among those who received the basic training, overall accuracy was 90.9 percent, and among the late starters, 86.1 percent. As in Kenya (see box page 123) the CHWs performed least well for the most severe cases.

Flexible supervision The evaluation recommended that supervision be tailored to individual needs—with more frequent visits for volunteers who have less training or are having difficulty. This allows for flexibility in dealing with the common problem of dropouts and the continuing need for new recruits.

Source: Hadi 2003.

year. In the Bangladesh program, supervisors visited CHWs every month and consulted on unresolved cases (see box at left). In the Sudan, the supervisor visited every two weeks and not only observed the CHW and reviewed her reporting forms, but talked to the village chief about community acceptance. A standard checklist helped the supervisor assess case management and provide feedback.

In Kenya, supervisors did not perform much better in the field than their respective CHWs.[29] Although supervisors are often health workers who once received basic IMCI training, they may not have had an opportunity to observe cases or practice skills. It can be useful to invite supervisors to the CHW training. Training opportunities are usually perceived as incentives. Joint training can also create a foundation for good relations.

Monitoring Forms and Data

The CHWs' records are typically the focal point of supervision. Were observed symptoms properly classified? Who got what drugs? What was the outcome? If simple and well designed, these forms provide a good basis for both case review and problem solving. They can also be used to provide input into a community-level Health Information System (HIS). A program in Rwanda has the CHW fill out a short form of just 12 questions each month.[30] The forms are compiled by health center managers for discussion at a monthly meeting. Results are fed into the regular HIS.

The conundrum for all of these programs is that supervision is hardest where it is most needed. Community-based ARI programs are vital in areas that have limited or no access to health facilities and

29 Gilroy et al. 2004 (draft)

30 Ibid.

where supervision may be next to impossible. ARI programs are therefore especially dependent on *retention of CHWs* so that the training and experience they gain is not quickly lost.

VARIATIONS ON EFFECTIVE CHW PROGRAMS

Behavioral challenges vary by ARI program model. Key variations include:

- Is case identification in the community "active" or "passive"?
- Do CHWs only treat cases, only refer cases, or do both?
- How are drugs dispensed?
- How many illnesses does the CHW assess and treat?
- What are the age groups the CHW is meant to serve?

Passive and Active Careseeking

The majority of effective programs described in the 2003 Lancet meta-analysis were based on an active case-seeking model. In other words, the CHW was responsible for visiting homes on a regular basis and detecting sick children. In many cases, CHWs also provided drugs in the home.

In a successful program in Bangladesh, CHWs visited every house in their catchment area on a monthly basis. In the India program using TBAs, women visited the homes of infants every two weeks. If a child needed antibiotics, the TBA came back every day to give the dose herself. The only African program described in the Lancet (conducted in Tanzania) also involved active case-seeking.[31] So far most community-based ARI programs have been carried out in Asia and there is need for more evidence of effective program models in Africa.

Active case-seeking is labor intensive and requires high commitment. How realistic is this kind of program on a large scale? Active case-seeking can be a way to *introduce* a program and to *educate* communities. It may be necessary to create initial awareness and also demand for services. In the Nepal program, community members did gradually begin to seek out the CHWs for treatment. An evaluation in one district showed that the percent of children treated who were brought to the CHWs by parents rose from 15 to 56 percent over three years.[32]

Treatment vs. Referral

Once a case is identified, the provider's responsibilities can range across a continuum from referral to varying levels of treatment. Because cotrimoxazole is taken over five days, compliance is important over a relatively long period (longer than for malaria treatment, for example).

Not surprisingly, programs in which the CHW can provide the drugs and in which she has more oversight in the home are more successful. These programs are also more intensive and invite additional government scrutiny.

The need for *demonstration* and *consensus* mean ARI programs cannot always start at scale. The program in Nepal was first launched as an operations research project to test the effectiveness of two different strategies. In one approach, the village health worker was equipped with a timer and assessed respiratory rates and referred children to the health facility for treatment. In the other group, CHWs could also give

31 Sazawal & Black 2003.

32 Houston 2001.

AN INTEGRATED COMMUNITY ARI - MALARIA - DIARRHEA PROGRAM

In Kenya, CARE initiated an *integrated* community-based program in the mid 1990s. Literate volunteers were selected by their own communities. They received training with an IMCI-like flowchart to assess and treat ARI, malaria, and diarrhea—conditions that often overlap. They followed a separate algorithm for infants under two months old. They also had various health education duties, for example providing counseling on family planning and HIV/AIDS.

The three-week training included role playing, videotaped examinations, and actual practice at a district hospital. The CHWs all received watches with second hands for counting respirations. CARE also provided job aids including registers and flowcharts.

Performance in CDD A source of confusion for the CHWs was that treatment guidelines for dehydration changed twice during the program. The evaluation showed they had most trouble detecting signs of severity for diarrhea. They assessed dehydration due to diarrhea 75-84 percent of the time.

Performance in Malaria Their performance was best for malaria; 90.5 percent of their assessments were accurate. However, they prescribed the right antimalarial dosage 66.7 percent of the time.

Performance in ARI CHWs remembered to ask parents about any history of cough or difficult breathing 80 to 88.2 percent of the time. They assessed severe pneumonia correctly 58.8 percent of the time. Difficulties were mostly due to the challenge of recognizing chest in-drawing.

Reluctance to Refer A review concluded that the CHWs performed well in most areas except in interpreting signs that would require referral. If they had doubts, they tended to choose less severe classifications, possibly because of fear they would be criticized by the health facility staff for mistakes.

Simplify, Simplify The complexity of the guidelines was a problem. They were six pages long and required 12 assessment tasks per child. The evaluation concluded a more simple flowchart would be more appropriate for the CHWs.

Sources: Kelly et al. 2001; CARE 2003.

antibiotics to children they identified as having ARI. An evaluation of both approaches demonstrated the greater effectiveness of allowing CHWs to actually dispense drugs, and was crucial in convincing the Ministry of Health to change its policy[33] (see box page 110).

In remote areas, referral isn't always possible. Where referral *is* a part of the program, different strategies can support families. In Peru, children with ARI received only the first dose of antibiotic from a community worker and were then referred to a facility. The referral was supported by a referral slip and also "counter-referral" slip for the parent to have filled out at the facility and brought back to the CHW. In this program, the CHW also supported the child in getting to the referral facility—helping with transportation and even radioing ahead to the facility.

33 Ibid.

Few programs can support referral in such a material way. However, a simple *counter-referral* form is essential to let the CHW know how the child was treated and to follow up.

Integrated Multiple-Disease Model

In malaria endemic areas, children often have both malaria and ARI at once. A study in Malawi that looked at the overlap between malaria and pneumonia found that 96 percent of children who met the clinical definition of pneumonia also met it for malaria.[34] The reverse is not as common. However, this overlap makes integrated assessment important. A WHO meeting in 2002 stated that it is unethical for community-based malaria programs not to include assessment and treatment for ARI.[35] It is common for a parent to bring a child with fever for treatment and then wait for the antimalarial to work. Critical days are lost. The death of such a child may also be attributed to drug treatment failure rather than to ARI.

Only a few countries have implemented community programs that assess both ARI and malaria. Kenya and the Sudan are two (see box page 123). One advantage of integrating with existing community-based malaria programs is that parents who don't recognize fast breathing but *do* recognize and act on *fever* will have their child assessed for ARI. Assessment in an integrated program requires a more complicated algorithm and training. The Kenya program attempted to teach CHWs an algorithm very similar to the one used by IMCI. Mortality dropped in the early period of the program.[36] However, the steps proved complicated for CHWs. An assessment concluded that simplicity is key. One reviewer recommended teaching basic symptom and counseling skills but reducing the basic algorithm:[37]

- If fever, give an antimalarial
- If fast breathing, give an antibiotic
- If diarrhea, give oral rehydration solution

And reducing referral messages to:

- If there are any other problems, send the child to a health facility
- If the child is not better the next day, send the child to a health facility
- If the child looks very sick, send the child to a hospital immediately

Of course, neither the practices nor the messages in this list are sufficient. Providers must always counsel on signs of severity and on dosage instructions. And for each of these diseases, some of the messages that are most often overlooked may be crucial. The lesson, however, is that ARI may seem to be a complex intervention, but for programs to be effective, key practices must be limited and messages must be memorable—for community providers as well as families.

34 WHO 1995.

35 WHO 2002.

36 CARE Kenya 2003.

37 Kelly et al. 2001.

Summary

Acute Respiratory Infections

Treatment Behavior change approaches focus primarily on treatment of Acute Respiratory Infections (ARI). Treatment consists of case management of illness: careseeking and caregiving.

Prevention Exclusive breastfeeding is especially important to protect young infants, who are the most vulnerable to death from pneumonia. Immunization against pertussis and measles protect against some serious infections.

Environmental health projects have investigated a number of other prevention behaviors—for example, ways to limit indoor smoke. Handwashing can also play a significant role in reducing infection.

TREATMENT: CARESEEKING AND CAREGIVING

Audiences and Actions in a Nutshell

Policymakers

- Adopt policies that give increased attention to ARI, including:
  - Management of ARI at the community level (CHWs and private providers)
  - ARI in the context of Newborn Health
- Support strategies that bring treatment closer to families (allow community health workers to dispense antibiotics, work with private providers, and support pre-packing)

Families

- Recognize signs of ARI and seek treatment promptly
- Give the right antibiotic, in the right dose, for the right number of days
- Recognize signs of severity and seek appropriate help promptly
- Encourage food/fluids during illness and give an extra meal during recuperation

Private Sector Drug Suppliers

- Sell the right antibiotic in the right doses for children with rapid/difficult breathing
- When parents ask for drugs to treat childhood fever, ask about symptoms of ARI

Community-Based Volunteers

- Give/sell the right antibiotic in the right doses for children with rapid/difficult breathing
- Recognize signs of severity and refer to a health center
- Counsel parents about signs of severity and feeding/fluids during illness, recuperation

Health Workers

- Give the right antibiotic in the right doses for children with rapid/difficult breathing

s u m m a r y

- Recognize signs of severity and treat or refer
- Counsel parents about signs of severity and feeding/fluids during illness, recuperation

What are the Key Challenges?

Many community-level ARI programs lost funding or disappeared with the introduction of IMCI. Program advocacy, formative research, training, and communication program design may all have to be launched as if this were a new health area.

- Policymakers and health system staff may not understand the need for community strategies or may not trust community workers to dispense antibiotics.
- In malaria endemic areas, presumptive treatment of fever may divert attention from ARI. Even when cases are "seen," they may be "missed" (see box at right).
- Signs of ARI are harder for both parents and community workers to recognize than those of other major childhood diseases.
- Formative research is essential to understand local terms for symptoms and illness concepts as well as careseeking. Patterns may vary by ethnic group.
- Mortality from ARI is highest in the first six months of life, but many families are reluctant to take young infants out of the home for treatment.
- Although 50-90 percent of antibiotics are provided by the private sector, only a very small number of projects have worked with drug sellers regarding ARI.
- Referral systems for severe cases are often very weak.
- Parents often give inadequate doses of antibiotics, contributing to anti-microbial resistance. (Cotrimoxazole, the first line drug, must be taken for five days.)

Why is ARI a Special Problem in Malaria Endemic Areas?

In malaria endemic areas, children with fever are "presumed" to have malaria. But many of these children also (or only) have ARI.

In many parts of Africa, it may even be difficult to know how many children are dying of ARI. Many ARI deaths may be attributed to malaria, or to malaria "treatment failure."

Why? Incidence of malaria is higher than ARI in these areas, so assessing /treating malaria may seem most urgent. Malaria is much better funded than ARI. And community workers trained to assess malaria are rarely trained to look for signs of ARI.

Fever and fast breathing often occur together. Parents are used to watching a fever for a few days to see if it subsides. But delay can be fatal in the case of ARI.

In 2002 WHO concluded that it is unethical for community-based malaria programs not to include assessment and treatment for ARI.

- Protocols may be outdated, especially at the community level, and the importance of fast/difficult breathing may not be emphasized. (Some programs still focus on blocked /clogged noses.)
- Most successful programs to date have relied on active *case seeking*, which is labor intensive.

How Can Communication Approaches Contribute?

Behavior change approaches can contribute at multiple levels: advocacy for needed programs, strategies to educate parents and promote use of CHWs, and improved training programs and materials for providers at several levels.

Advocacy

- Conduct advocacy with health policymakers for programs that bring treatment closer to communities (via both community health workers and private providers).
- Improve acceptance of existing programs by feeding monitoring data back to policymakers to demonstrate effectiveness/safety of interventions.
- Encourage local health system support for community programs (highlight monitoring data that shows decreased burden on health system, etc.)
- Promote collaboration with newborn programs. Strategies for newborns require active caseseeking because most are not taken out of the home.

Research

- Conduct focused ethnographic research to investigate family practices and local terms. Integrate these in training and communication materials.
- Conduct formative research on prescribing and counseling behaviors of both public and private providers. Analyze barriers/benefits to ideal practices from their perspectives.

Providers and Health System Linkages

- Support providers with simple materials/messages to improve counseling skills.
- Create job aids for health workers and community volunteers (diagnosis and treatment charts).
- Support training programs for health workers and community volunteers with participatory and skill-based approaches. Observation of real cases and practice are both key. Videos are very helpful.
- Help design training programs for private providers; support with simple reminder materials, point-of-purchase materials.
- Promote strong links between community volunteers and the health system. Including supervisors from the health system in training for CHWs will improve their skills as well and can be a draw for them.
- Design and test materials to improve referral and counter-referral.
- Help design simplified, low-literacy algorithm for integrated ARI, malaria, and CDD programs.
- Strengthen supervision systems with behavioral approaches, streamlined materials such as checklists.

Families/Communities

- Design activities to educate communities about signs of ARI and the need for seeking appropriate care without delay. Use local terms/illness concepts.
- Design strategies to promote careseeking from appropriate providers (e.g., CHWs if they are trained and have drug supplies). Focus on family members who are in charge of care decisions. (Care outside the home may require approval by males.)
- Promote the importance of completing a full dose of antibiotics.
- Design incentives, motivation strategies to help retain CHWs.