Acute respiratory infections control in the context of the IMCI strategy in the Americas

Controle das infecções respiratórias agudas no contexto da estrategia AIDPI nas Américas

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Abstract *As infecções respiratórias agudas (IRA) são importante causa de morbidade e mortalidade em menores de cinco anos. Importantes contrastes são observados em relação a isto nos diferentes países das Américas, e também entre regiões ou estados de um mesmo país. A morbidade está associadada a vários fatores, especialmente com a situação nutricional das pacientes e o tempo de aleitamento materno. Também as características dos cuidados prestados a essas crianças durante a doença são essenciais, com destaque para a percepção dos pais ou responsáveis em relação à doença, os cuidados que os mesmos prestam à criança durante a doença, a preocupação em decidir e consultar os serviços de saúde, a forma em que esses cuidados são oferecidos pelos serviços de saúde e em que as orientações são cumpridas em casa. Especial preocupação deve existir em relação à resistência bacteriana aos antibióticos, sendo um problema crescente na América, com uma média de 26,1% de resistência do Streptococcus pneumoniae à penicilina. Os antibióticos são freqüentemente utilizados de forma irresponsável com 70% das crianças com IRA recebendo-os desnecessariamente. Controlar as IRA tem-se tornado prioridade. Intervenções preventivas como as atuais vacinas conjugadas para Haemophilus influenzae e Streptococcus pneumoniae, e o manejo padronizado de casos, como proposto pela estrategia Atenção Integrada a Doenças Prevalentes na Infância (AIDPI), aparecem como os mais importantes passos para este problema de Saúde Pública.*

Key words *Infecções respiratórias, Cuidado da criança, Educação em saúde, Serviços de saúde*

Resumo *Acute respiratory infections (ARI) are an important cause of morbidiyty and mortality in children all over the World, particularly in developing countries. Contrasts in mortality can be observed among the countries in America, and also within the countries. Contrasts are also observed in morbidity, associated with differences in nutritional status, absence of breast-feeding and characteristics of care given for ill chidren. Parents perception of disease, patterns and habits of care administered to child during the illness, level of concern about decision to seek assistence, manner in wich care is sought and extent to wich recommendations are followed have great influence in the course and outcome of the disease. Bacterial resistance to antibiotics is an increasing problem in America, with an average of 26,1% resistance of Streptococcus pneumonia to penicilin. Antibiotics are frequently used in irrational way, and up to 70% of ARI receive antibiotics unnecessarily. Controlling IRA has become a priority. Preventive interventions with vaccines, specially current conjugate vaccines against Haemophilus influenzae and Streptococcus pneumoniae, and standardized case management, as proposed by Integrated Management of Childhood Ilness (IMCI) seems to be the most important steps for this public health problem.*

Palavras-chave *Respiratory tract infections, Child care, Health education, Health services*

Introduction

Since the 1960s, acute respiratory infections (ARI) have been one of the most serious public health problems for young children, as these illnesses have consistently been among the five leading causes of death in children under five.[1] Although by the end of the 20th century child mortality from ARI had declined, thousands of boys and girls continue to die each year from these diseases, and many more suffer periodic episodes.[2] Acute respiratory infections remain a serious health problem for children in most countries of the world - particularly in developing countries, where mortality and severe morbidity indices are considerably higher in the developed countries.

The proportion of child mortality and morbidity attributable to ARI is not the only reason why these infections constitute a major public health problem. Given the frequency of these illnesses in children under five, the care that must be provided for them imposes a significant burden on parents and health services in terms of time and money.[3] In addition, the care provided by the family and the health services is not always the most efficient way to treat these illnesses. Improper care often leads to complications and additional problems, such as those associated with the excessive and improper use of antibiotics, which is one of the main reasons for the recent rise in bacterial resistance to these drugs.[4]

Under the framework employed in recent decades, implementing programs for the prevention and control ARI was a priority. These programs promoted first, the development of specific strategies[5] and then, integrated strategies,[6] all aimed at preventing respiratory infections, reducing their duration and the probability that they might worsen, and preventing mortality. Together with these objectives, control strategies were proposed as a tool for standardizing diagnostic and treatment criteria to improve the quality of care administered to children in the health services and in communities.[7]

ARI as a cause of infant mortality

Although mortality from ARI has declined in recent decades, at the end of the 20th century these infections continued to account for some 5% to 10% of deaths in children under five in the Western Hemisphere.[2] However, the situation varied from country to country. While ARI were responsible for around 3% of under five mortality in Canada and the United States, in countries such as Ecuador and Peru the proportion of ARI-related deaths in this age group was around 20%.

The estimated risk of death from respiratory illnesses during the first five years of life in 1999 was 344,3 per 100.000 population in Guatemala, and as low as four per 100.000 population in Canada. Children under five in Guatemala, therefore, had a relative risk of 86,1 compared to children in that age group in Canada. This reveals the large contrasts in early childhood mortality from respiratory illnesses among the countries of the Region.

These contrasts can also be observed within the countries by disaggregating mortality figures by states, provinces, departments, or other administrative divisions.[8]

An analysis of mortality from pneumonia and influenza in Peruvian children under five in 2000 showed that the relative risk of dying from these causes during the first five years of life was more than seven times higher in some departments than in the departments with lower mortality rates. The differences were even more marked in a similar study conducted in Argentina. Children under five in the province with the highest mortality from respiratory illnesses had a relative risk of dying from these causes 11 times higher than for children who lived in the province with the lowest mortality.

These differences, which show the contrast between and within countries, are also seen in historical trends. Although in recent years mortality from respiratory illnesses has declined overall in the Region of the Americas and within the majority of the countries, the rate of this decline has varied (Table 1). The differences between countries are also replicated when trends are analyzed within the countries themselves. Comparing provinces, states, or departments, the rate of decline has been several times slower in some than in others.[8]

Table 1

Comparison of the average annual percentage decline in mortality from pneumonia and influenza in children under five, in selected countries of the Americas, 1980-1990 and 1990-2000.

Country	1980-1990		1990-2000		
	Rate at the beginning of the decade	Annual decline during the decade	Rate at the beginning of the decade	Annual decline during the decade	Rate at the end of the decade
Argentina	68,6	8,8	27,7	7,1	11,3
Brazil	131,9	7,1	58,1	7,8	26,5
Canada *	7,8	10,2	2,9	4,2	1,9
Cuba	37,9	5,9	22,4	9,1	8,7
Ecuador	182,4	7,9	86,4	5,1	58,2
United States **	7,8	5,8	4,2	5,3	2,4
Mexico	235,7	7,6	111,4	11,6	27,5
Nicaragua ***	81,4	4,4	105,9	10,3	26,9
Panama	48,8	6,3	23,4	-2,3	27,4
Paraguay	108,9	6,1	53,9	2,2	34,8
Uruguay	37,8	2,8	33,7	6,8	17,0
Venezuela	61,1	6,1	49,1	6,0	24,0

* Mortality figures for Canada for 2000 were not available, so the average annual percentage decline corresponds to 1979-1989 and 1989-1999. The year 1987 is omitted from the 1979-1989 period because figures for that year were not available; ** Mortality figures for the United States for 2000 were not available, so the average annual percentage decline corresponds to 1979-1989 and 1989-1999; *** The average annual percent decline for Nicaragua for 1980-1990 was calculated for the period from 1983-1990 because the figures were not available from 1980 to 1982.

Note: The average annual percentage decline was calculated by linear regression of the logarithm with base 10 of annual mortality rates, using the least squares method.

Source: IMCI (Integrated Management of Childhood Illness) Regional Unit. Program on Communicable Diseases (HCT), Division of Disease Prevention and Control (HCP). Based on vital statistics information from the Ministries of Health of each country. PAHO (Pan American Health Organization); 2002.

As a result of these different rates of decline in countries and their administrative divisions, the gap between areas has increased. The relative risk of dying from respiratory illnesses is several times higher for children under five in certain regions than for those in others.

Table 1 shows the trend in mortality from pneumonia and influenza, which were the leading causes of death from respiratory illnesses in children under five for selected countries in the Hemisphere during the last two decades of the 20th century. From 1980 to 1990, the fastest rate of decline was in Canada, where annual mortality fell by 10,2% throughout the period. The rate of decline in Nicaragua and Uruguay, in contrast, was less than half that figure. As a result of this difference in the rate of decline, the relative risk of dying from pneumonia and influenza during the first five years of life - which was 4,8 for Uruguay and 10,4 for Nicaragua *versus* that of Canada at the start of the 1980s - had more than doubled (11,6) in Uruguay and tripled (36,5) in Nicaragua by the end of the decade.

The situation changed in the following decade. While the rate of decline in mortality from pneumonia and influenza in children under five was cut by more than half in Canada (4,2% annually *versus* 10,2% in the previous decade), the rates of decline in Nicaragua and Uruguay were more than double those of the previous decade, with annual rates of 10,3% and 6,8%, respectively. As a result, the relative risk of dying from these illnesses during the first five years of life in 2000, compared to the end of the previous decade, was reduced to 8,9 for Uruguay and to less than half, 14,2, for Nicaragua.

Comparing the rate of decline in mortality from pneumonia and influenza between countries is also

important for verifying the existing potential to reduce the differences. Table 1 shows that Canada was able to reduce its mortality from pneumonia and influenza in children under five at a rate of 10% annually over a decade, starting from a mortality of 7,8 per 100.000 population. This figure is far below the rates recorded in other countries at the beginning of the 1990s; notwithstanding, the rates of decline in many of these countries were under 10% annually and in some, less than half.

ARI as a cause of morbidity

The proportion of early childhood deaths attributable to respiratory illnesses can be considered a primary indirect measure of the incidence of these illnesses during the first years of life. However, mortality is significantly linked with factors associated with the severity of the episodes and with access to and use of available treatments to halt the disease and prevent it from becoming fatal.

Studies on the incidence of respiratory illnesses in early childhood lead to the conclusion that these are the most common causes of deteriorating health during the first five years of life.[9-13] It is estimated that during this period, children suffer between four and eight episodes of respiratory infections.[14] Episodes are more frequent in urban areas than in rural areas (six to eight episodes *versus* four to six episodes annually).

The frequency of these illnesses is associated to a great extent with the airborne transmission of the germs that produce them, both viruses and bacteria, and with the fact that children under five spend most of their time in enclosed spaces accompanied by adults or other children, which fosters the transmission of respiratory infections.[15-20]

To this average incidence of respiratory illnesses should be added other factors that come together to cause episodes to be more frequent, last longer, and be more severe. Particularly important are factors associated with greater irritation of the respiratory mucous membrane, which contribute to the colonization of that membrane by viruses or bacteria. Of these factors, the ones most frequently associated with respiratory infections, or with their severity, are air pollutants in the home, particularly smoke from cigarettes or from kitchens or stoves that use solid fuels for combustion.[17,20-22]

Other risk factors are also related to the greater frequency, severity, or duration of respiratory illness in early childhood. Of particular note are malnutrition and the absence of breastfeeding.[15,17,20,23-26] Malnutrition lowers the body's defenses and puts it at greater risk of colonization by bacterial or viral agents that cause respiratory infections. As a result, episodes of these diseases are more serious and last longer. For its part, the lack or short duration of breastfeeding deprives children of the natural defenses transmitted from mother to child through breast milk. For this reason, children who are not exclusively breastfed are more susceptible to respiratory infections, and there is a greater risk that episodes of such illnesses will be more serious and last longer.

Characteristics of care for children under five with respiratory illness

In addition to the epidemiological conditions that determine the extent of the risk of young children contracting respiratory illnesses, as well as other factors such as nutritional status and breastfeeding practices, the care given to children once they have fallen ill is also critically important.[27-30]

Five aspects of care greatly influence the course and outcome of respiratory illness: parents' perception of the disease; patterns and habits of care administered to child during the illness; the level of concern in terms of the decision to seek assistance outside the home; the manner in which that outside care is sought; and the extent to which the recommendations regarding care are followed.

Parents' or caregivers' perceptions of the illness can be different. To some, symptoms of respiratory disease in their children are common and do not arouse particular concern.[31,32] This occurs most frequently if the child habitually has a cold or symptoms such as a cough or a runny nose. If the child is not perceived as ill, the care that he or she receives will be no different than usual. In the event of respiratory illness, this circumstance will be pivotal, since the lack of special care during episodes can cause the problem to become more persistent or even worsen.

When children suffer from respiratory illness - even when the illness is not serious - they are less interested in eating or drinking. Less eating contributes to a deterioration in their nutritional *status*, and less liquid intake diminishes hydration of the respiratory secretions that serve as a vital defense mechanism for eliminating germs from the organism and warding off their colonization.

Respiratory illness exacerbates a child's inadequate nutritional *status*, while malnutrition in turn makes the respiratory episode worse or prolongs it. When families do not perceive the illness, children are given the customary care, and as a result, are not

encouraged to eat more or drink more fluids.

In contrast, once the child's parents or caregivers perceive the illness and recognize it as such, their response can be a determining factor. This behavioral response basically includes the care administered to the sick child at home; how the level of concern relates to the decision to seek care outside of the home; the manner in which that care outside the home is sought; and the extent to which the care recommendations given to the parents are followed.

Care of the child in the home once the parents perceive that he or she is sick implies behavioral changes that can either help the child recover or make the problem worse.[31,32] In some instances, parents reduce feeding or eliminate certain foods during the illness, apply ointments, offer herbal teas, administer drugs, etc. Their actions can be detrimental in some cases - for example, when they decide to reduce feeding or eliminate certain foods that are important energy sources for the child's recovery, or if the drugs or herbal teas administered are deleterious to the child's health.

Such actions also can delay care-seeking and, if treatment is required, make the illness worse and put the child's life in danger.

The level of concern of the child's parents or caregivers determines when they decide that the illness requires care that they are not capable of providing.[30,32-38] The criteria employed by parents to identify this moment are different, as are the symptoms which they base the decision that the child needs care outside the home.

A low level of concern is generally associated with delays in utilizing the available health services, and, in cases where the illness progresses rapidly, with greater risk of the child dying at home. The delay in seeking help allows the illness to worsen to the critical stage, making treatment more prolonged and difficult, requiring more complex interventions, and increasing the risk of complications and sequelae (such as neurological sequelae that can follow septicemia or meningitis that begins in the lungs).

The manner in which outside care is sought also is important, because once parents have decided that the child's illness warrants outside care, they have different options at their disposal. These include traditional healers, drug retailers, or community or institutional health workers.[34,36,37,39,40] Depending on the type of care sought, the family's initial contact for assistance outside the home can lead to the use of traditional methods to treat the illness and not necessarily to treatment by health services.

In other cases, the initial outside contact to treat the child's illness is drug retailers that are not always pharmacists, and from whom the families obtain medicines that they consider beneficial for treatment. The use of drugs without a prescription from health workers exposes the child to unnecessary or even detrimental drugs (such as cough syrups), or to inappropriate antibiotics, with the consequent risk of contributing to bacterial resistance to these drugs.

Finally, the extent to which recommendations for care are followed is also critical. Even when families seek early assistance from trained health workers, they often fail to follow the treatment as prescribed.[41,42] This can result in the child not receiving the quantities of drugs necessary to cure the illness, which makes the illness worse, requiring additional treatment. In other cases, although the illness may not worsen and the child recovers, inadequate administration of drugs can have other detrimental effects. This scenario is of particular concern in the case of antibiotics, which are sometimes administered in lower doses than required, or with incorrect intervals between doses, or for less time than the prescription indicates–all of which can contribute to the emergence of bacterial resistance.

Bacterial resistance to antibiotics: an additional problem

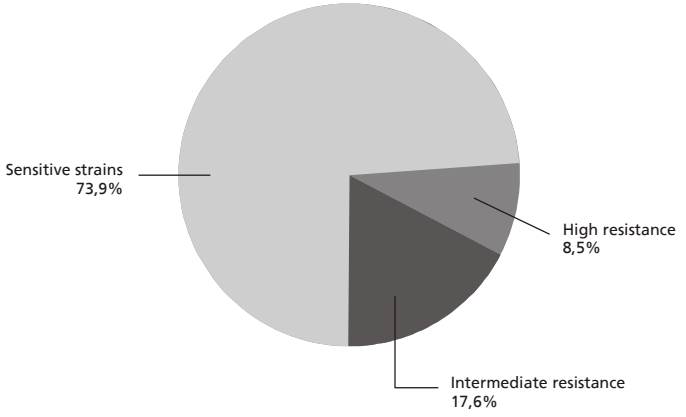
At least 30% of all hospitalized patients currently receive one or more cycles of antibiotic therapy, and these compounds have cured millions of infections that could otherwise have been fatal. At the same time, however, the compounds are among the products most misused by practicing physicians and have even been abused. A result of the widespread use of antibiotics has been the appearance of pathogenic microorganisms resistant to them. This in turn has been the springboard for the ever-growing need for newer drugs, which have substantially contributed to the spiraling costs of medical care.[43]

Although some of the factors that contribute to the appearance of resistant bacteria are beyond human control, others are not.[7,44] The presence of antibiotics, which enables resistant bacteria to proliferate, is the most controllable factor.

In general, the emergence of resistant bacteria has coincided with the widespread use of antibiotics and is due to the frequency with which the resistant bacteria come into contact with these drugs. Antibiotics have thus played a key role in inadvertently selecting strains of resistant bacteria[45] that can reproduce in greater quantity once the sensitive bacteria are destroyed by the antimicrobial treatment. This has increased the levels of bacterial resistance.[46-48]

Figure 1

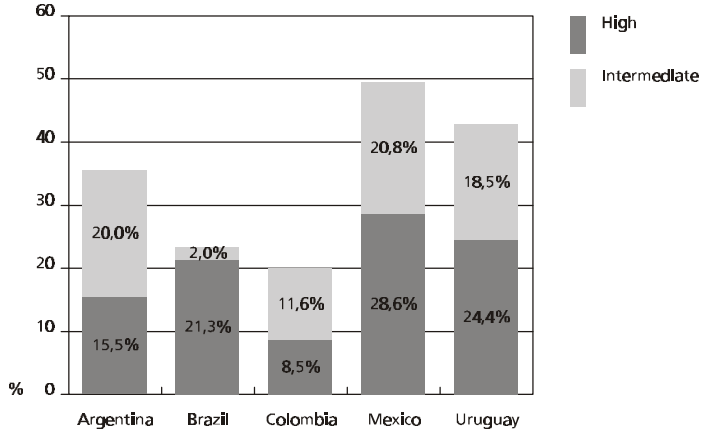
Sensitivity of *pneumococcus* to penicillin in Latin America and the Caribbean. Results of surveillance of resistance, 1994-1998.



Source: Benguigui Y, Di Fabio JL. Vigilancia epidemiológica del Streptococcus pneumoniae en niños de América Latina. Bol Pneum Sanit 1998; 6 (1).

Figure 2

Levels of resistance of *Streptococcus pneumoniae* to penicillin in selected countries of Latin America. PAHO (Pan American Health Organizatopm), WHO (World Health Organization), SIREVA (Regional Vaccination System); 1994 -1999.



Since the use of antibiotics has also played a key role in mitigating the effects of infectious diseases and preventing deaths from them, the emergence of resistance seems an unavoidable side effect. However, that perspective does not take into account the fact that antibiotics are very frequently used unnecessarily and indiscriminately.[49-53] Even more to the point, the use of antibiotics in low dosages, or for less time than recommended to eliminate the bacteria responsible for the illness, serves to increase the frequency of contact between the bacteria and the antibiotic-contact that facilitates bacterial resistance.

Since respiratory infections are the leading cause of illness during the first five years of life, and in many of these cases, antibiotics are prescribed as treatment, it can be concluded that the infections themselves contribute to the emergence of resistance. Most studies of the most frequent diagnoses of ARI at the primary health care level[49,53] have shown that only 10% to 20% are classified as requiring treatment with antibiotics. However, up to 70% of ARI cases seen at the primary health care level are treated with them. This irrational use of antibiotics is considered a significant factor contributing to the emergence of resistant strains of bacteria.

Aggravating this situation, the frequent prescription of antibiotics for ARI at the primary health care level has transferred this same practice to populations that then initiate treatment of subsequent episodes with these drugs without prior consultation with health workers.[54,55] In developing countries, where antibiotics can either be acquired freely or where there is little enforcement of regulations to control such practices, the unnecessary use of these drugs has been extended from the health services to the community, where people acquire these products without a prescription from health workers. This practice is particularly dangerous among low-income groups. In order to save money, many people do not use the health services and therefore obtain only a fraction of the treatment necessary.

The Region of the Americas has high levels of bacterial resistance to antibiotics, particularly in certain countries.[8,56-58] *Streptococcus pneumoniae* resistance to penicillin is 26,1% on average. This figure includes 8,5% regarded as a high level of resistance and 17,6% as intermediate resistance (Figure 1). Comparing countries (Figure 2), the figures range from 20,1% in Colombia to 49,4% in Mexico, according to a study conducted by Regional Vaccination System (SIREVA) during the period 1994 - 1999. Levels of high resistance ranged from 2% in Brazil to 20,8% in Mexico, and levels of intermediate resistance from 8, 5% in Colombia to 28,6% in Mexico.

Alternatives for control

Since respiratory diseases are a major cause of mortality and morbidity during early childhood, controlling them has been a priority for countries. Efforts have been directed toward prevention as well as early diagnosis and effective case management.

Preventive interventions are based on the possibility of having vaccines available that facilitate the prevention of ARI episodes, particularly for serious respiratory illnesses such as pneumonia that are the cause of most deaths.[59-61] Early diagnosis and effective treatment are based on the establishment of standard criteria that, when applied by primary care health workers, systematize treatment and case management in a manner that ensures the highest quality of care. These criteria also include educational content for parents and the community to ensure appropriate levels of concern and early consultation when there is an illness, as well as to promote care for children that reduces the risk and worsening of illness and fosters healthy growth and development.

Vaccines

Various studies have recognized the effectiveness of the current vaccines against *Haemophilus influenzae* and *Streptococcus pneumoniae* as a means of reducing the incidence of diseases of the respiratory tract in early childhood. The incidence of illnesses caused by *Haemophilus influenzae* - among them meningitis, pneumonia, and otitis - has been reduced in numerous countries with the administration of the vaccine.[62-64] Similar studies are being published on the impact of vaccination against pneumococcus on the incidence of invasive disease caused by this bacterium.[65-68]

It should be noted that the results discussed in the previous paragraph generally correspond to developed countries, since the use of the *Haemophilus influenzae* vaccine in developing countries has been more recent.[69] Use of the vaccine against Streptococcus pneumoniae is affected by the distribution of the serotypes of this bacterium most prevalent in each country.[70] The available vaccines initially covered the most common serotypes of *Streptococcus pneumoniae* found in the Northern hemisphere. However, the vaccines were rather ineffective for the developing countries of the Americas, where there is a high prevalence of serotypes not included in the vaccine.

In addition, the immunogenic strength of the initial vaccines was not high enough for children under two, who constitute one of the groups at highest risk and require the greatest protection.[71]

At present, various types of vaccines against *Streptococcus pneumoniae* are being tested. These vaccines are highly immunogenic for children under two and combine different serotypes of the bacterium, making their use in developing countries potentially feasible.[72-74] These advances have been accompanied by research that has allowed for a better description of the epidemiological distribution of the Streptococcus pneumoniae serotypes in the countries of the Americas,[56,58,70] opening up short-term prospects for the incorporation of vaccines to prevent invasive diseases caused by this bacterium.

Standardized case management

The implementation of standard case management of early childhood respiratory illnesses is directed towards the early detection of cases by the family and the health services and towards improving the criteria for the management and treatment of cases once they are detected.

Standard case management (SCM) of acute respiratory infections was the first strategy disseminated regionally by the Pan American Health Organization (PAHO). It represented an important advance in systematizing the criteria for the evaluation, classification, and treatment of childhood respiratory illnesses on the basis of the available scientific information.[5]

Application of the SCM/ARI strategy improved the management of acute respiratory illnesses at the primary care level.[75,76] Evaluations in the countries showed the strategy's impact in terms of reducing the unnecessary use of antibiotics,[77,78] diminishing the frequency of complications from respiratory illnesses (particularly secondary pleural effusion to pneumonia),[78,79] and rationalizing the use of chest x-rays as a tool for diagnosis.[77,80]

The use of the strategy was restricted in practice to care of children under five whose symptoms met the criteria (cough or difficult breathing). Thus, children brought to health services for other reasons but had related respiratory problems did not benefit from the strategy. Opportunities for the early detection of respiratory illnesses were therefore missed because parents did not identify the early signs of disease.

Integrated Management of Childhood Illness, the principal intervention currently promoted by PAHO for improving child health, addresses the problem by integrating the specific strategies for the management of illness into a single approach.[81]

IMCI involves a series of steps that must be followed whenever there is contact with a child under five. It permits the detection of any sign of illness,

even though that illness might not be the principal reason for the consultation. The IMCI strategy also systematically includes disease prevention and health promotion activities, in this way turning any and all contact with a child under five into an opportunity for preventing disease and promoting healthy habits for growth and development during the first years of life.

Control of respiratory illness in children is thus one of the main components of the IMCI strategy. Application of the strategy makes it possible to identify all children with any sign of respiratory infection, evaluate them, and classify them in terms of the severity of the illness and the treatment required. It also allows for differentiating between children who require hospitalization, those who need antimicrobial treatment, and those who can be treated at home with measures to relieve their symptoms.

Application of the IMCI strategy has improved the detection of respiratory problems, since it involves checking for any symptoms of these illnesses in all children examined, rather than only in those whose parents mention respiratory illness as the reason for the consultation. Applying the criteria for evaluation, classification, and treatment in the IMCI strategy has made it possible to rationalize the use of diagnostic resources, reduce the use of antibiotics in cases with symptoms of pneumonia, and improve parents' knowledge about adequate care of children in the home and about the early warning signs indicating the need to seek assistance outside the home.

Initial evaluations of the IMCI strategy[82-85] have demonstrated its importance in improving the quality of care provided by primary health services.

Application of the IMCI strategy has been particularly important in fostering the appropriate use of antibiotics in managing ARI cases in children under five. A study in Santa Fe, Argentina[86] shows that health services with staff trained in the IMCI strategy are much less likely to over-prescribe antibiotics for ARI treatment than are services without such trained staff, where the relative risk of over-prescribing antibiotics was 3,05, with a $p < 0,001$. Other studies in Latin American countries[87] have also shown a reduction in the unnecessary use of antibiotics for ARI treatment when the IMCI strategy is applied.

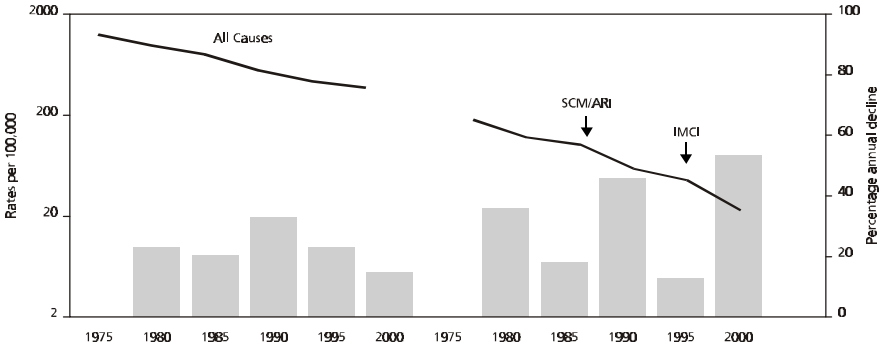
Reducing the unnecessary use of antibiotics is an important direct contribution of the IMCI strategy to containing bacterial resistance, particularly if one takes into account that most health services over-use antibiotics for ARI treatment.[88]

The available data from the countries show an increase in the rate of decline in mortality from respiratory illness since the implementation of the IMCI strategy (Figure 3). Preliminary surveys that compare areas with high IMCI coverage with areas where the strategy has yet to be implemented show a significant difference in the rate of decline in mortality from respiratory illness (Figure 4).

Based on these findings, implementation and strengthening of the IMCI strategy for health services and communities is currently the principal intervention for the control of respiratory illness as a public health problem.

Figure 3

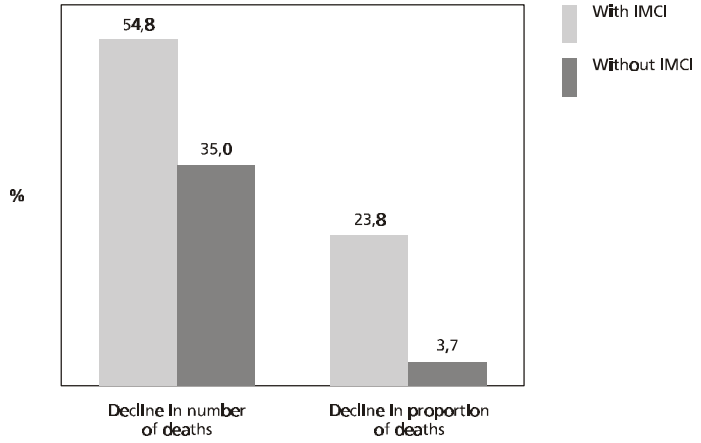
Total mortality trends and trends for acute respiratory infections in children under five years of age in 18 countries of the Americas, 1975-2000. Rates p
100.000 Inhabitants and percentage decline every five years between 1975 and 2000.



ARI = Acute respiratory infections; SMC = Standard case management; IMCI = Integrated Management of Childhood Illness
Source: Special program for health analysis (SHA), Program on Communicable Diseases, IMCI (Integrated Management of Childhood Illness). Regional IMCI (HCT/IMCI). PAHO (Pan American Health Organization), WHO (World Health Organization); 2002.

Figure 4

Decline in mortality from causes addressed by the IMCI (Integrated Management of Childhood Ilness) strategy in departments in Peru, 1996-2000. Comparison between departments with and without IMCI.



Source: Regional IMIC (Integrated Management of Childhood Ilness) database. Program on Communicable Diseases. Division of Disease Prevention and ControL (HCT/HCP). PAHO (Pan American Health Organization), WHO (World Health Organization); 2002.

Outlook

Implementation of the IMCI strategy has helped to accelerate the decline in mortality from respiratory illness and reinforce the benefits shown by the SCM/ARI strategy in terms of improving the quality of health care for children with respiratory illness, both in the home and in the health services. Although the development and administration of vaccines helps to prevent the most serious respiratory infections, vaccines will have an ever-greater impact once they cover a larger population. Incorporating these vaccines into the IMCI strategy - as they have already been incorporated into the Expanded Program on Immunization - will help to attain higher coverage levels. Current efforts to strengthen implementation of IMCI and its expansion in communities thus will lay the groundwork for a steady decline in mortality from respiratory infections.

In this way, IMCI becomes the most efficient intervention to prevent and control respiratory infections in children, with the potential to accelerate the decline in mortality from these causes and give families access to quality care for these illnesses.

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Submitted on September 16, 2002
Final version resubmitted on November 18, 2002
Approved on January 10, 2003