

Integrated Management of Childhood Illness (IMCI)
Family and Community Health Area (FCH)
Healthy Life Course Project (HL)

TECHNICAL ADVISORY GROUP on IMCI (IMCI-TAG)

Integrated Management in the Context of the
Maternal-Newborn-Child Health Continuum
Report of the Sixth Meeting

Texas Children's Hospital, Houston, Texas, USA
28 and 29 October, 2008



Texas Children's Hospital[®]



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This document contains a summary of the sixth meeting of the Technical Advisory Group on IMCI (IMCI-TAG), together with the conclusions and recommendations prepared by the group in light of the current status of the problems addressed by the IMCI strategy and the progress made in its implementation in the Region of the Americas.

The sixth meeting of IMCI-TAG was held at Texas Children's Hospital, Houston, TX, USA, on 28 and 29 October 2008. The meeting was coordinated by Dr. Javier Torres-Goitia, who is a member of IMCI-TAG.



Contents

1. Introduction

Foreword	v
Welcome by Ann Stern, Senior Vice President, Texas Children's Hospital	vii
Introduction by Dr. Gina Tambini, Manager, Family and Community Health, PAHO/WHO	x

2. Objectives of the Meeting xii

3. Progress in carrying out recommendations proposed by the Technical Advisory Group on IMCI (IMCI-TAG) from 2001 to 2006

Dr. Yehuda Benguigui, Newborn, Child, and Youth Health Project / Family and Community Health, PAHO/WHO	1
--	---

4. Neonatal health within the continuum of maternal, newborn, and child care: Regional strategy and plan of action

Dr. Rolando Cerezo, Institute of Nutrition of Central America and Panama (INCAP), PAHO/WHO	11
--	----

5. Experiences with Hurricane Katrina and actions of the Texas Children's Hospital during the Hurricane Ike emergency.

Dr. Joan Shook, Chief Safety Officer and Co-Physician in Chief, Texas Children's Hospital	17
---	----

6. Importance of the political process for adaptation of the IMCI strategy in national policies: The example of Argentina

Dr. Juan Carlos Bossio, Consultant, Newborn, Child, and Youth Health Project / Family and Community Health, PAHO/WHO	27
--	----

7. The role of social pediatrics in children's health care

Dr. Manuel Katz, Ben Gurion University, Beer-Sheva, Israel, Universidad Maimónides, Buenos Aires, Argentina	35
---	----

8. Why has mortality decreased in Pediatric Intensive Care Units?

Dr. Fernando Stein, Associate Professor of Pediatrics, Baylor College of Medicine, and Medical Director, Texas Children's International.....	41
--	----

9. The importance of incorporating evidence-based interventions in the content of IMCI

Dr. Francisco Martínez, Regional Consultant on Neonatal IMCI, PAHO/WHO.....	49
---	----

10. Integration of the nursing schools of Latin America and the Caribbean into the IMCI process: A new perspective

Dr. Rolando Cerezo, Institute of Nutrition of Central America and Panama (INCAP), PAHO/WHO	59
--	----

11. Conclusions and Recommendations..... 63

12. Annexes

Annex I: Objectives and Agenda.....	67
--	-----------

Annex II: Participants

1. Members of IMCI-TAG.....	70
------------------------------------	-----------

2 PAHO/WHO Consultants.....	70
------------------------------------	-----------

3. Members of the Texas Children's Hospital.....	71
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The health of the world's children constitutes a priority for governments, and the international community has an ethical imperative to ensure that children enjoy optimal conditions for their healthy growth and development.

1

INTRODUCTION

PROLOGUE**Dra. Mirta Roses Periago***Director*

Pan American Health Organization / World Health Organization

**Dr. Mirta Roses Periago**

The health of the world's children constitutes a priority for governments, and the international community has an ethical imperative to ensure that children enjoy optimal conditions for their healthy growth and development.

We are increasingly aware of the particular vulnerability of children to the social, economic, and environmental conditions that surround them. These conditions, taken together, constitute key determinants of child health. They can have serious health impacts that persist and even deepen throughout the life cycle, giving some children the possibility of reaching their full potential while tragically limiting the development of others.

This inequality is unacceptable. The countries and the international community made a commitment to erase it when they adopted, in the year 2000, the Millennium Development Goals to be achieved by 2015.

More than half of the time envisioned for reaching these goals has passed, and it is urgent that we redouble our efforts to protect child health. We must ensure that each and every child in our countries enjoys the benefits of the knowledge and tools available for prevention and treatment of diseases and for promotion of their health and development.

The quest to achieve the health and development objectives set forth in the Millennium Development Goals has strengthened the understanding of health in the context of its determinants. The goals call not only for the reduction of morbidity and mortality but also for the improvement of social, cultural, and environmental conditions. This in turn has strengthened the vision of health and health care as continuing throughout the life cycle, and it has focused attention on the levels and types of intervention necessary to achieve this continuum of care.

It is increasingly clear we must ensure a safe birth and neonatal period as the foundation for healthy growth and development during childhood. But this cannot occur unless we also take steps to protect the overall health of women, including each woman's right to plan her pregnancies and to receive high-quality care during pregnancy, childbirth, the postpartum, and the rest of her life.

More recently, we have also emphasized the role of the male partner in supporting the woman during pregnancy, at delivery, and after the birth. In short, we have become conscious that the entire family unit has an important role to play in improving child health and development.

Given the complex interrelationship between the different members of the family in the context of communities, our approach to health can no longer be limited to the detection and treatment of specific medical problems. Such a narrow focus is inadequate to ensure the well-being of the family and the community.

The integration of health interventions is increasingly critical, as it has led to a marked reduction in missed opportunities to improve people's health. Integration not only affects the approach to specific health problems or diseases, but, more broadly, encourages teamwork within the health services, cooperation between the health services and the community, interdisciplinarity, and coordination between the different sectors involved in children's health.

The Pan American Health Organization, jointly with its Member States, has been working actively to strengthen the integration of efforts to improve health in general and children's health in particular.

Increasingly active coordination and participation of the countries in this endeavor has led to a fruitful exchange of experiences and to the adaptation of lessons learned to the diverse realities of the countries and the regions within them.

The continuous review and updating of technical strategies, based on the latest scientific evidence and on analysis of determinants linked to the social, economic, cultural, and health environment, has also produced more effective responses to the different health challenges in the Region of the Americas.

The emphasis on strengthening primary health care has increased the access of the most vulnerable groups to these integrated strategies, adapted to be culturally appropriate, and has led to advances in child survival, growth, and development. It has also helped enable local health teams, working closely with communities, to adapt the information, knowledge, and key practices required to improve child health.

Now is the time to deepen this entire process and extend it to the most remote corners of the hemisphere. Bold actions to improve the access of populations to strategies for improving child and family health can help ensure that, in the years remaining before 2015, the entire Region of the Americas, including all of its countries and inhabitants, achieves the Millennium Development Goals.

Dr. Mirta Roses Periago

Director

Pan American Health Organization

Regional Office of the

World Health Organization

WELCOME

Ann Stern

Senior Vice President

Texas Children's Hospital

On behalf of Texas Children's Hospital I want to welcome you to Houston. I want to thank you for your leadership as well as your participation in this forum. This is a great occasion for us to be together.

We are here this morning to once again act upon a longstanding commitment between the Pan American Health Organization and Texas Children's Hospital and our commitment to maternal and child health throughout the Americas and, in fact, throughout the world.

The United Nations Millennium Development Goals established in September of 2000 set up a clear path for progress on the issues of poverty, education, and the environment. In particular, three of those eight goals are specifically focused on health and health status; these goals are to combat HIV/AIDS and malaria; to reduce child mortality, specifically to reduce by two thirds the child mortality rate among children under 5; and to improve maternal health, in reducing by three quarters the maternal mortality rate.

Texas Children's Hospital is committed to the creation of a global community of healthy children and has firmly focused on the resolution of these issues.

Our commitment to the first of these goals is present in the Baylor International Pediatric AIDS Initiative at Texas Children's, which we refer to as BIPAI. Established in 1996, BIPAI is the largest treatment program worldwide dedicated to improving the health and the lives of children with HIV/AIDS. The mission of BIPAI is three-fold: to conduct a program of high quality, high impact and highly ethical pediatric and family HIV/AIDS care and treatment; to impact health professional training, and to increase that training and to provide clinical research.

The growth and expansion of the care and treatment of children with HIV/AIDS is possible through the creation of an exemplary clinical care model called the children's clinical center of excellence, as well as a network that links these sites together so that they may share training, knowledge and best practices between the clinics. These centers are designed to catalyze pediatric HIV/AIDS care and its treatment regionally and globally.

BIPAI Centers have been established in Romania, Botswana, Lesotho, Swaziland, Malawi, Uganda, Burkina Faso and Tanzania. To address the shortage of qualified health professionals, which is so marked in these countries, BIPAI has also cre-



Ann Stern

ated the Pediatric AIDS Core, which was established in June of 2005. The Pediatric AIDS Core was designed to immediately scale up the treatment and care of HIV infected children in sub-Saharan Africa and to supplement local health professional's capacity, which is so needed.

Its two-part mission includes providing the primary pediatric and HIV/AIDS care and treatment, but also training African health professionals so that they may expand the treatment of HIV infected children in sub-Saharan Africa.

Texas Children's dedication to the Millennium Development Goals of reducing childhood mortality and improving maternal health has its roots not only in our commitment to excellence in patient care, education and research, but also in the strength of our partnerships with the Pan American Health Organization. Our history of collaboration is quite strong. We are continually thankful for the support PAHO offers each year at the Texas Children's Hospital International Colloquium, a very important forum for discussion and collaboration on critical issues within child health.

Texas Children's is also honored to host the annual meeting of the Integrated Management of Childhood Illness (IMCI) Technical Advisory Group for the fourth time. Recently, Texas Children's was honored to receive notice of our designation by the World Health Organization as a Collaborative Center for Perinatal and Neonatal Health. We are truly humbled by this designation and feel a strong and distinct responsibility to deliver in every way possible an opportunity for international collaboration.

We also feel that this unique and remarkable opportunity for collaboration comes at just the right time in our institution's history. As part as what we called Vision 2010, we at Texas Children's are set to embark on the frontiers of pediatric medicine through an enhanced commitment to research, particularly neurological research trough the creation of the Neurological Research Institute and also into an expansion of patient care services to include high risk obstetrics. This is a new world for us, but it links so critically to what already do. With the rise of high risk births regionally, nationally and internationally, Texas Children's Hospital identified the need to expand its services into maternity care for high risk births. Core to this philosophy is the ability to treat children from pre-conception to post-delivery. The Texas Children's Maternity Center is set to open in 2011 and it will provide a natural link to the care we already provide in our level two and three neonatal intensive care units. The ability to create a continuum of care between mother and child will greatly enhance the quality of care that we provide to families through the early lives of their child.

The creation of the full service maternity center will allow for convenient and comprehensive care for mothers and their babies all in one single facility, no longer having to move back and for between two different facilities. Areas of expertise will include reproductive endocrinology, infertility, fetal surgery, fetal cardiology and neonatology.

Once fully operational, we anticipate 5,000 births a year, focusing on high risk deliveries. The new center will be connected to the main hospital campus and will have 15 floors, 720,000 square feet and 102 patient beds. It will be a beautiful facility but, more importantly, the programs that it contains will make a difference to families, to mothers and to their babies.

Texas Children's Hospital currently operates the world's largest level three neonatal unit. So the

addition of this targeted high risk obstetrics program will allow Texas Children's newborn program to continue to grow and to serve the community.

Texas Children's Maternity Center will provide unparalleled pediatric care to the unborn and to newborns with advanced care needs; again, complementing the services that we already have in fetal surgery, fetal cardiology, and genetics, as well as our newborn center.

IMCI itself was created in large part to address the significant mortality that occurs in children within the first 90 days of their lives. Texas Children's is committed to continuing to serve as a strong partner in IMCI to advance the cause of patient care education and research by sharing new learning experiences, particularly in the areas of maternal and child health.

The continued collaboration of PAHO and Texas Children's is not only welcome, it is essential. Our collective efforts are high impact and sustainable, both marks of great work.

Thank for your partnership, thank you for your presence here in Houston. This is important; in fact, this is a crucial conversation that we must have.

We look forward to a productive meeting over the next two days and a continued dynamic working together.

Thank you so much.

Ann Stern

Executive Vice President
Texas Children's Hospital
Houston, TX, USA

INTRODUCTION

Dr. Gina Tambini

Manager, Family and Community Health

Pan American Health Organization / World Health Organization



Dra. Gina Tambini

Social and economic conditions have been widely recognized as fundamental determinants of the health and well-being of populations. More recently, they have been included in the set of demographic and health factors that are considered key determinants of the overall health situation. This vision has helped broaden our understanding of diseases and health problems, which are now seen as the outcome of a complex interaction of factors and not only as resulting from the interaction between the biological status of the individual and a particular disease agent.

Although there have been important and continuing advances in knowledge of the factors that affect health, only recently has it been fully understood that, from a health perspective, children are not simply small adults, and that such a notion fails to take into account the magnitude of the threat that environmental factors pose to children. It is therefore even more important to look at the multiple determinants of health when considering child health and development.

In this context, an integrated approach to children's health care becomes essential. It is the only way to ensure a broad perspective that goes beyond a narrow focus on a specific problem or situation to consider children in the larger environment in which they live and grow.

Integrated Management of Childhood Illness (IMCI) was conceived as an approach that combines different interventions aimed at prevention, treatment, and health promotion, and that can be adapted to the different epidemiological and health situations of the areas where it is applied. The strategy comprises three implementation components related to health workers, to the organization of the health services, and to the community.

As a result, the process of implementing IMCI has given rise to ongoing coordination within the health sector aimed at identifying, on the one hand, the different diseases and problems to be addressed and, on the other hand, the interventions available for their prevention and control. But this coordination has also expanded beyond the health sector into the areas of social development, education, and infrastructure, among others. This makes it possible to harmonize plans for responding to the health problems that are identified in the course of applying the strategy.

As a result of this broad process of evolution, the IMCI strategy includes not only numerous components related to different diseases and problems that threaten child health, but also approaches and tools that can be used by interdisciplinary health teams and by communities. Accordingly, the IMCI strategy in its current form

provides an appropriate response to the needs of the countries through evidence-based scientific interventions that are integrated in a coherent approach that takes into account the different stages of life, the different levels of health care, and the different types of health intervention.

IMCI has integrated complementary components that make it part of the continuum of health care for women, including maternal health and perinatal health. The strategy thus strengthens the emphasis on the child's family environment, taking into account not only the child's own health but also the health of the mother and other members of the family.

Tools for the application of IMCI can be used to improve knowledge and practices in the family and community regarding the care and treatment of children and to integrate this care with that provided by community health workers and primary health care services. The strategy also covers care provided in primary referral hospitals, creating a continuum of comprehensive care that spans the family, the community, the primary health care services, and the hospitals.

Finally, IMCI includes interventions aimed at early diagnosis and treatment that can be applied as part of primary health care, as well as actions geared to disease prevention and health promotion that can promote better growth and development during childhood.

The expansion of the IMCI strategy since its launch in the mid-1990s reflects its importance as a means of responding to the new epidemiological, economic, and social conditions facing the countries in the Region of the Americas. The time between the launch of the Millennium Development Goals in 2000 and the 2015 target for achieving the goals is already half gone. IMCI should be regarded as one of the key strategies that will need to be strengthened if the international community is to fulfill its commitments in this regard.

The "Regional Strategy and Plan of Action for Neonatal Health within the Continuum of Maternal, Newborn, and Child Care," recently approved by the Directing Council of PAHO, reaffirms the key role that IMCI can have in supporting achievement of the MDGs in the coming years. Through broad intersectoral coordination, promotion of active community participation, and a comprehensive view of the multiple determinants of child health, the countries can advance toward the achievement of better and more equitable health for all the children of the hemisphere.

Gina Tambini

Manager

Family and Community Health Area

PAHO/WHO

2 Objectives of the Meeting

1

Analyze the new political and epidemiological scenarios that affect the health of children in the Region of the Americas throughout their life cycle, considering the determinants of health status and the role of the IMCI strategy in this process.

2

Identify key actions that can help accelerate the development of national plans to promote peri-neonatal health and equitable universal access to maternal, neonatal, and child health care in the context of the continuum of care, with emphasis on reaching the most vulnerable population groups.

3

Propose lines of action, activities, and plans for strengthening health information systems and systems for surveillance, monitoring, and evaluation.

4

Analyze community interventions and propose community mobilization activities and social communication strategies to promote healthy behaviors within primary health care and in the context of the continuum of care.

5

Identify key activities at the regional level and in the countries that can create and strengthen partnerships and associations and the mobilization of resources to support sustainable implementation of the IMCI strategy within the health services, the community, and the family.

3

Progress in carrying out recommendations proposed by the Technical Advisory Group on IMCI (IMCI-TAG) from 2001 to 2006



Dr. Yehuda Benguigui

Project Coordinator

Newborn, Child, and Youth Health

Family and Community Health (FCH)

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Regional Office of the

World Health Organization

Between 2001 and 2006, the Technical Advisory Group (TAG) on the Integrated Management of Childhood Illness (IMCI) strategy reviewed advances in development and implementation of IMCI and sought to identify new ways to strengthen its positive impacts on child health. The recommendations proposed by IMCI-TAG in 2001–2006 can be grouped according to 10 main themes:

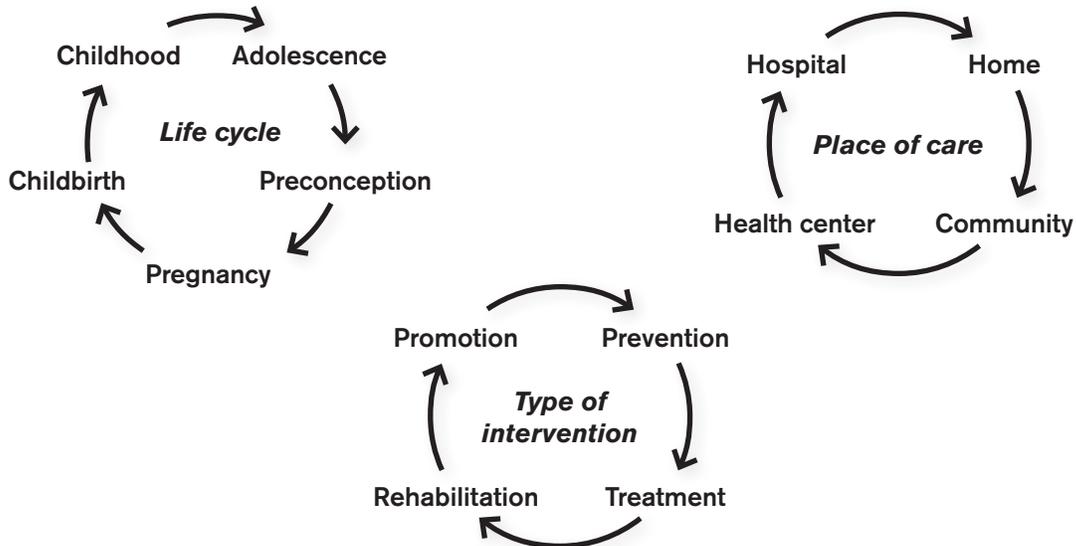
- > IMCI and the continuum of care
- > The new components of care
- > IMCI in medical and nursing schools
- > IMCI in the training of health workers
- > IMCI in the family and community
- > IMCI in social communication
- > IMCI and information, monitoring, and evaluation systems
- > Outcomes related to the application of IMCI, reflected in operations research and in scientific publications on the subject
- > The role of partnerships and associations with multiple stakeholders in the application of IMCI, and mobilization of resources for its expansion
- > Future prospects of IMCI in the international arena

These principal themes or lines of action were discussed during the first five meetings of IMCI-TAG and were included in the reports of the meetings as either recommendations or conclusions.

In the last of these five meetings, a point of emphasis was the need for IMCI to strengthen its role in relation to three broad dimensions of the continuum of care of women, mothers, newborns, and children. These three dimensions have to do with the life cycle, the place of care, and the type of intervention (Figure 1).

Figure 1. IMCI and the continuum of care

The continuum of care for mothers, newborns, and children

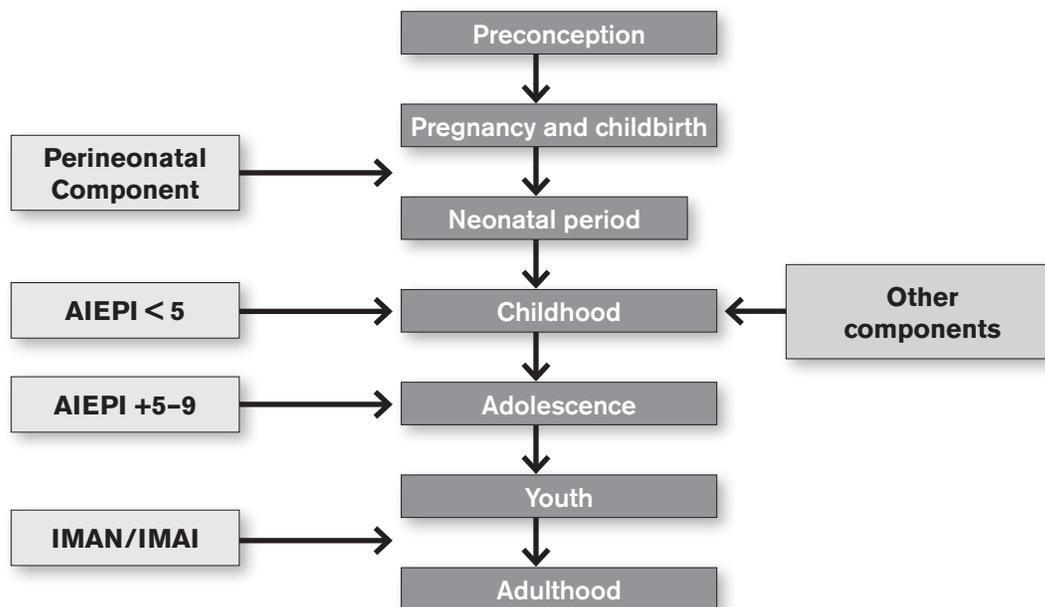


The *life cycle* includes a sequence that begins with preconception and moves through the stages of pregnancy, childbirth, childhood, and adolescence, at which point the cycle begins anew. The *place of care* encompasses the different providers of health care viewed in terms of the place where care is provided, a continuum that exists in practice. The home is the natural first place where health care is provided and where the decision is made about the possible need to seek care outside the home. Home care is complemented by care in the community and its social support networks, the second place of care. This is followed by care at a health center and finally a hospital, sites where people seek assistance when they need external support in dealing with a health problem. Finally, there is a continuum with respect to the *type of intervention*, including interventions geared to health promotion, disease prevention, diagnosis and treatment, and rehabilitation.

Advances in the development of tools and interventions to strengthen IMCI with respect to the *life cycle* continuum were reinforced when the 48th Directing Council of PAHO approved the “Regional Strategy and Plan of Action for Neonatal Health within the Continuum of Maternal, Newborn, and Child Care” (Document CD48/7).

Efforts are currently under way to develop integrated strategies of care throughout the life cycle (Figure 2), linking these strategies with each other and with the original IMCI strategy.

These components developed within the framework of IMCI are included as part of general care. They provide a continuum of care throughout the life cycle, from childhood through adolescence, pregnancy, and the neonatal period. The development of integrated strategies of care throughout the life cycle focuses on the specific stages of life, including reproductive health care before conception, care during pregnancy and

Figure 2. Development of integrated strategies of care throughout the life cycle

childbirth, and care and treatment of the newborn. These strategies are linked with the interventions already included within IMCI for the proper care and treatment of children, and they are linked subsequently with the component geared to children under 10 years of age, which is another component of the IMCI strategy within the framework of the continuum of care throughout the life cycle.

The expansion of the strategy to address the care of children aged 5 to 9 years and its linkage with strategies aimed at adolescents allows for more coherent responses through primary health care. The life cycle approach interlinks the different interventions and strategies and responds to the needs of every age group within the comprehensive framework provided by the IMCI strategy.

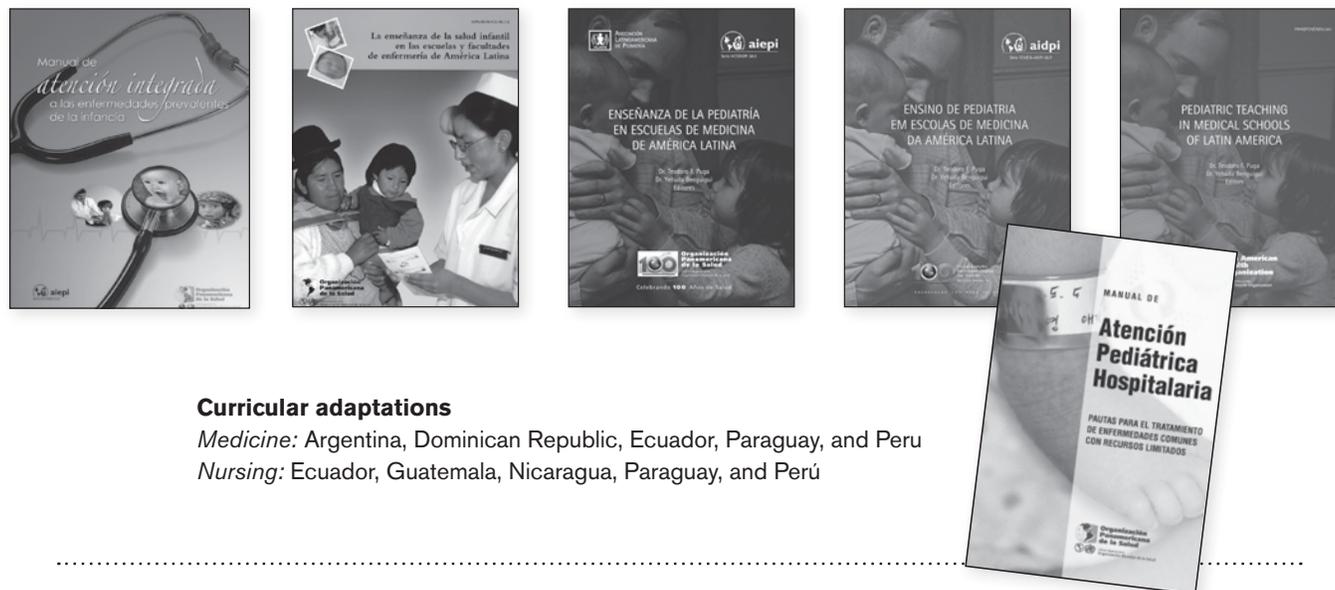
Among the new components of IMCI are a number of handbooks and courses. Examples include *Monitoring Child Development in the IMCI Context*; *Complementary Course on HIV/AIDS*, and its adaptation for Latin America and the Caribbean; *Una visión intercultural para los pueblos indígenas de las Américas* (Intercultural vision for the indigenous peoples of the Americas), which needed to be adapted and developed using a methodology suited to the approach; *Curso de atención y rescate pediátrico en desastres* (Course in pediatric care and rescue in disasters); *Manual clínico AIEPI neonatal* (Clinical manual on neonatal IMCI); and *Manual AIEPI neonatal para estudiantes* (IMCI neonatal manual for students). Also important are various works at different stages of preparation that represent expert consensus on topics such as childhood epilepsy, diabetes, child abuse and child sexual abuse, asthma and obstructive pulmonary disease, oral health, congenital rubella, dengue, and Chagas disease, as well as the dermatological and ophthalmologic atlases. All these publications help provide broad coverage of subjects related to the care and treatment of children through IMCI.

Figure 3. The new components of IMCI



One of the new components of IMCI is a module developed for the hospital level, Diagnosis and Treatment of Severe Childhood Diseases. This module was adapted to the specific characteristics of the different countries, and versions have been published in Guatemala, the Dominican Republic, Nicaragua, Paraguay, Brazil, and Ecuador.

Consistent with the recommendations of IMCI-TAG, work has continued with medical colleges and schools. Over the past few years, medical schools in some countries have adapted their curricula based on a survey carried out in the medical schools jointly with the Latin American Pediatrics Association (ALAPE) (Figure 4).

Figure 4. IMCI in medical and nursing schools**Curricular adaptations**

Medicine: Argentina, Dominican Republic, Ecuador, Paraguay, and Peru

Nursing: Ecuador, Guatemala, Nicaragua, Paraguay, and Perú

A module has been prepared for use in the pediatrics departments and is being distributed through PAHO's Expanded Textbook and Instructional Materials Program (PALTEX). It is easily available to students in all medical schools and colleges in Peru, Argentina, Ecuador, and Paraguay, and in nursing schools in Guatemala, Nicaragua, Paraguay, Ecuador, and Peru.

In different countries of the Americas, such as Brazil, Peru, Bolivia, Ecuador, Colombia, Guatemala, Honduras, Nicaragua, El Salvador, and Paraguay, work was done on the family and community component (Figure 5).

All the IMCI-TAG meetings to date have included recommendations on IMCI in the community. Materials developed in this area include guides for facilitators, coordinators, community leaders, volunteers, teachers, and health professionals. The materials were developed and adapted by the countries and have already been used successfully in Peru, Colombia, Ecuador, and Bolivia.

Also in keeping with the recommendations of IMCI-TAG, materials have been prepared to strengthen the social communication component of IMCI, focusing on key family practices (Figure 6).

The development of IMCI materials for social communication has focused on both mass and interpersonal communication. In terms of their content, the materials promote key interventions aimed at improving children's health and development, as well as community neonatal IMCI. They can serve as a guide for community diagnosis of the social-epidemiological situation, identification of risk factors in the family and the community, and identification of the specific aspects and recommendations most applicable to these communities.

Figure 5. IMCI in the family and community



Bolivia, Brazil, Colombia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, and Peru

Figure 6. IMCI and social communication



Advocacy / Social mobilization / Social marketing / Community communication/ Mass communication
Interpersonal communication

Successful experiences in Perú, Colombia, Ecuador, and Bolivia

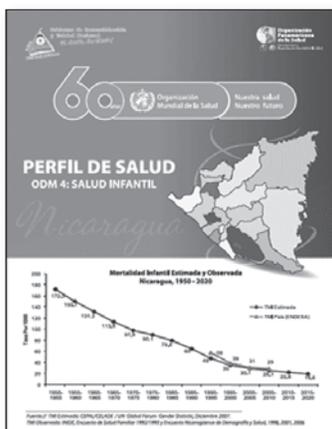
A concern expressed during the last three meetings of IMCI-TAG, and especially emphasized in the most recent one, was the need to establish reliable baselines characterizing the current situation so that subsequent progress achieved through implementation of the strategy can be measured. This is the only way to determine whether the interventions are the correct ones. In addition, having a baseline makes it possible to identify areas in which changes have not occurred, which in turn can help determine the need for adaptations in the strategy to increase its impact and more effectively reach the most vulnerable areas and population groups.

Work is underway on country profiles related to child health, using a methodology developed for this purpose (Figure 7). Two workshops in Bolivia and Nicaragua have provided examples of what can be done with the proposed indicators and with subsequent monitoring of national information by geographic area, resulting in a document that touches on the technical, epidemiological, and political situation.

The countries have used these documents as a basis for monitoring interventions in relation to benchmarks that have been set for measuring progress toward the Millennium Development Goals (MDGs). The documents are complemented by instruments to strengthen supervision, monitoring, and evaluation; when adapted for use by the health services and the community, they become practical tools for the local level. In this regard, protocols are being developed within the framework of the continuum of care in health facilities at the local and community level, including both outpatient care centers and hospitals. These protocols include instruments and methodologies that are currently undergoing design and field testing.

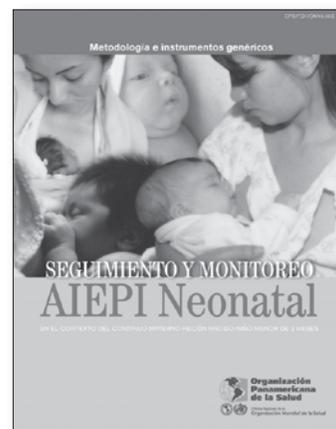
Several countries (Honduras, Guatemala) have already made some progress in developing information systems for follow-up and monitoring of the application of IMCI in the continuum of care for mothers, newborns, and infants under 2 months, with publications that include the methodology and generic instruments as well as the profile of the health situation.

Figure 7. IMCI in information, monitoring, and evaluation systems



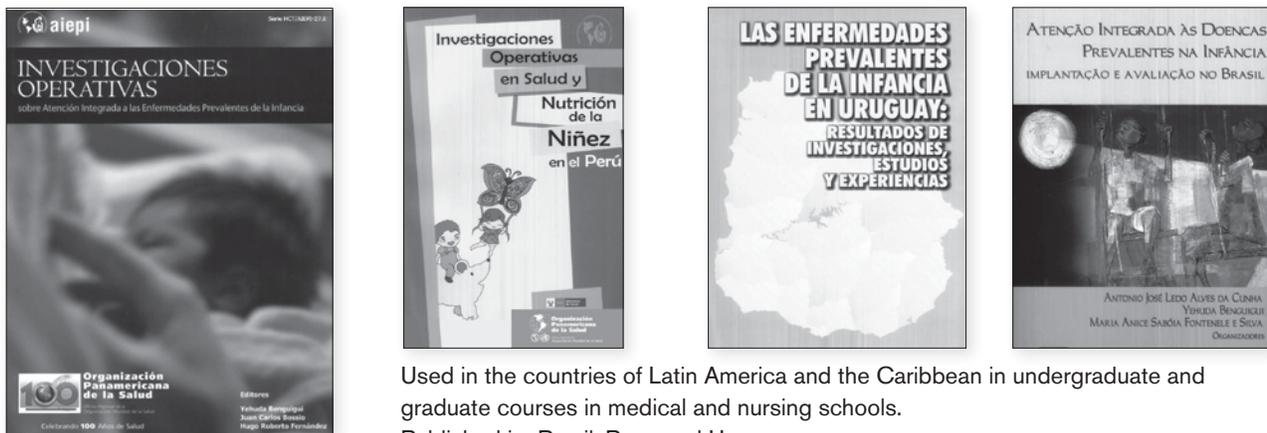
Country profile – Child health
 National level: 20 countries
 Nicaragua: published
 Expansion: Honduras and Guatemala

Regional adaptation:
 Bolivia and Nicaragua
 Expansion: Honduras,
 Dominican Republic, and Ecuador



Another of the recommendations that IMCI-TAG has formulated since its first meeting concerns the need to accompany the implementation of IMCI with operations research and to publish the results of national experiences. In keeping with this recommendation, a basic set of generic protocols was prepared and disseminated to all the countries, where it has been used in undergraduate and graduate courses in medical and nursing schools.

Figure 8. IMCI in operations research and publication of national experience



Generic material

Used in the countries of Latin America and the Caribbean in undergraduate and graduate courses in medical and nursing schools.
 Published in: Brazil, Peru, and Uruguay
 In draft form: Colombia, Nicaragua, and the Dominican Republic

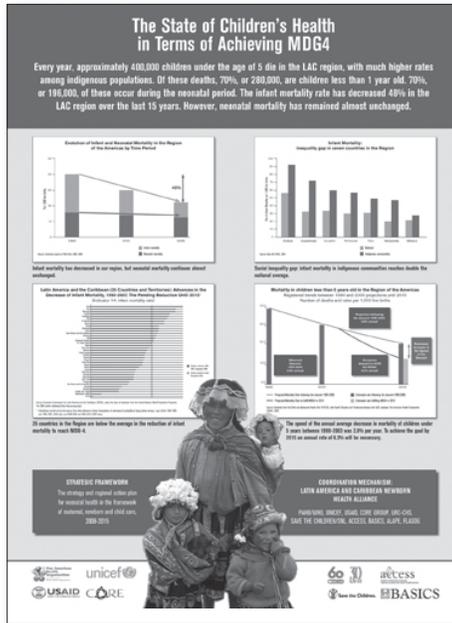
Three countries have national experiences with the adaptation and application of the research protocols and have already issued national publications that summarize the results obtained. These publications not only serve as a national reference for each country but also enrich the literature on the impact and outcomes of the application of IMCI in children's health care.

Another issue of great concern is the sustainability of the strategy. Ways must be found to mobilize the resources needed to not only sustain the progress made to date, but also extend coverage of IMCI. This requires continuous efforts to publicize the benefits of the strategy and build partnerships and associations for resource mobilization. This work is being carried out with different international cooperation agencies, the intergovernmental banks (World Bank, Inter-American Development Bank), nongovernmental organizations (NGOs), scientific societies, corporations and the private sector, and faith-based organizations, among others.

There are four major partnerships working with IMCI (Figure 9): the Regional Neonatal Alliance, the regional partnership, the regional initiative "Act NOW for Women and Children," and the regional partnership on nutrition, health, and development which involves various United Nations agencies.

These partnerships are calling for joint action to strengthen interventions aimed at achieving the eight Millennium Development Goals, particularly MDG 4, which relates to the reduction of child mortality.

Figure 9. IMCI with partnerships and associations for resource mobilization



Regional Neonatal Alliance
 Global Partnership
 Regional Initiative “Act NOW for Women and Children”
 Regional Alliance on Nutrition

Work carried out with bilateral agencies, banks, NGOs, scientific societies, the private sector, faith-based organizations, and PAHO/WHO Collaborating Centers.

Targets for the reduction of child mortality use the year 1990 as an epidemiological baseline, as was agreed in the World Summit for Children. The first objective calls for reducing under-5 mortality by one-third between 1990 and 2000. Starting in 2000, the countries committed to reducing child mortality by an additional one-third. Thus, MDG 4 specifies that by 2015, under-5 mortality shall have been reduced by two-thirds with respect to the 1990 level.

Estimates prepared by PAHO indicate that in the period 1990–2000, the average reduction in under-5 mortality was 2.6% per year (Figure 10). If the reduction continues at this pace, the target established by MDG 4 will not be achieved by 2015.

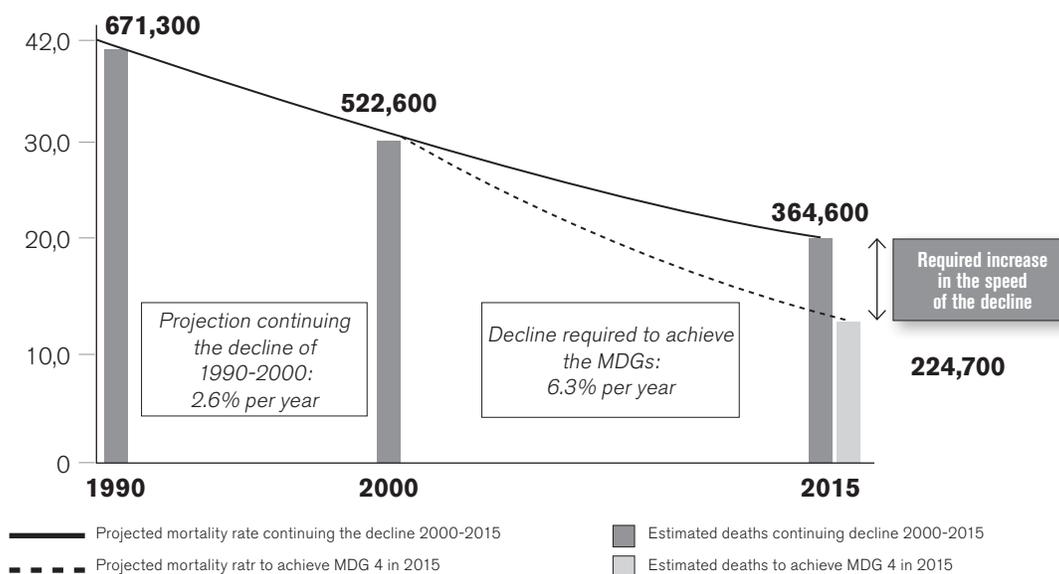
If we hope to achieve under-5 mortality in 2015 that is two-thirds lower than the 1990 level, we will need to increase the speed at which mortality declines, achieving an average reduction of 6.3% per year. This can only happen if interventions have a significant impact on the peri-neonatal age group, which represents 70% of infant mortality in the majority of the countries of the Region.

In conclusion, the current priority is to continue to strengthen all interventions that contribute to the achievement of the Millennium Development Goals, and especially MDG 4. The principal instrument at our disposal is the Neonatal Plan of Action, which will allow us to emphasize measures aimed at achieving a 70% reduction in mortality among children under 1 year of age in the Region. The implementation of these actions should go hand-in-hand with maintenance of the progress already made in reducing postneonatal mortality, especially from acute respiratory infections and diarrheal diseases. Both neonatal and postneonatal interven-

tions should take place within the context of the continuum of care promoted by the IMCI strategy, with four major areas of action: creation of an enabling environment for promotion of neonatal health; strengthening of health systems and improvement of access to maternal, neonatal, and child health services; promotion of community interventions; and establishment and strengthening of surveillance, monitoring, and evaluation systems at all levels.

Figure 10. Under-5 mortality in the Region of the Americas
Trend recorded between 1990 and 2000 and projections to 2015

Source: IMCI (OMS), 2004.



4

Neonatal health within the continuum of maternal, newborn, and child care: Regional strategy and plan of action



Dr. Rolando Cerezo, INCAP/PAHO

Dr. Rolando Cerezo

Institute of Nutrition of Central America and Panama (INCAP), PAHO/WHO

Every year more than 190,000 newborns in the Region of the Americas die within the first 28 days of life, representing an average neonatal mortality for the continent of 14.3 per 1,000 live births. This rate, like every regional average, masks large differences between countries. In Latin America and the Caribbean, national rates range from a low of 9.7 per 1,000 live births in the Southern Cone countries up to a rate almost twice as high, 18.3 per 1,000 live births, in the countries of the Spanish-speaking Caribbean.

Across the Region, neonatal deaths represent more than 60% of infant mortality and almost 40% of mortality in children under 5. For this reason, the implementation of interventions to reduce these deaths is essential to achieve the targets for the reduction of infant mortality and under-5 mortality that the countries have set as part of the Millennium Development Goals.

In order to strengthen regional and national actions to improve the coverage and quality of neonatal health interventions, and in response to the recommendations of IMCI-TAG, a strategy of Neonatal IMCI has been developed. This strategy complements the interventions already developed for children aged 1 week to 5 years with others specifically directed to the peri-neonatal period.

PAHO has prepared a regional strategy and plan of action for the implementation and expansion of the neonatal component of IMCI within the framework of the continuum of care. Adopted as a Resolution by the Directing Council of PAHO, it includes actions in different settings, taking into account the geographic, social, cultural, and economic differences between the countries of the Region of the Americas.

Average perinatal mortality in the countries of the Region is estimated at 21.3 per 1,000 live births. As noted above, this average conceals large differences both between and within individual countries. It also conceals the underregistration of fetal mortality, which is not registered in all the countries and which is equal to or greater than early neonatal mortality. In addition, perinatal mortality rates in general are calculated on the basis of officially registered deaths. The statistics may be skewed in areas where a high proportion of births take place in the community rather than in health care facilities, since in these settings deaths that occur just a few hours or days after birth typically are not registered with the authorities.

In recent years, new interventions and initiatives have been designed to increase access to skilled delivery care, since only 80% of the population has access to it. Since 2000, work has been carried out with the community component of IMCI, and with social security institutions and other institutions that provide health care, using incentives to increase the population's use of the services. It is expected that all these interventions will lead to an increase in coverage of the population with proper care during pregnancy, delivery, and the first days of life, to complement the attention already provided through IMCI.

The interventions designed to improve peri-neonatal health are linked and combined with others; for example, those intended to eradicate vaccine-preventable diseases in the countries of the Americas. In this regard, the Region has undertaken initiatives to eradicate neonatal tetanus in 2010 and is working actively to achieve a drastic reduction in cases of congenital rubella syndrome. These goals are made possible by the availability of vaccines and by the expansion of coverage that is being realized through plans and actions to provide proper care to women during pregnancy and childbirth.

Other efforts are focusing on the provision of micronutrients for dietary supplementation. For example, the IMCI strategy includes the administration of zinc to reduce the incidence of diarrheal diseases and respiratory infections, which in turn will help deepen the reduction already observed in mortality from these causes.

Actions have also been incorporated for the prevention of mother-to-child transmission of HIV infection, but the expected reduction has not yet been achieved. There is thus a continuing need to expand the coverage of these interventions, for which the neonatal component of IMCI is essential.

The strategy of Neonatal IMCI, framed within the continuum of care, is based on the close relationships that exist between health and well-being of women, newborns, children, and adolescents, in both the family and the community. The linkages between stages of the life cycle are reflected in the continuum of care. By increasing the availability of and access to evidence-based interventions, we will be able to improve peri-neonatal health, child health, and adolescent health, which in turn will contribute to the sustainable development of families and entire societies.

The development of the Strategic Plan of Action is based on existing evidence of cost-effective, high-impact interventions. It reflects an interinstitutional consensus on the imperative to reduce peri-neonatal mortality and morbidity in Latin America and the Caribbean.

Based on this plan, a group of agencies, including PAHO, have begun working on maternal mortality, giving rise to a plan of action for reducing perinatal mortality. The plan reflects the commitment by the governments of the Region to orient their activities for the next eight years to ensuring that all mothers, newborns, and children in Latin America and the Caribbean receive the appropriate, effective, quality care they need to live healthy and productive lives, thus making MDG 4 a reality.

The strategic areas in which the Plan will work (Figure 1) include, first of all, the creation of an enabling environment for the promotion of neonatal health, so that all families can become informed on key practices related to women's health care, proper care during pregnancy and childbirth, and care of newborns. So that this knowledge can be turned into action, the second strategic area calls for strengthening health systems to guarantee access to high-quality, culturally acceptable services at a cost that is affordable for families and communities. This will permit the entire population to have access to health care for women, newborns, and children that makes use of evidence-based practices of prevention, diagnosis, and treatment.

Figure 1. Regional Strategy and Plan of Action

Strategic areas

1. Create an enabling environment for the promotion of per-neonatal health
2. Strengthen health systems to improve access to maternal, newborn, and child health services
3. Promote a community-based interventions
4. Develop and strengthen surveillance, monitoring, and evaluation systems

Guaranteeing people's access to these services is a foremost challenge for the coming years, given the great difficulty that most countries of Latin America and the Caribbean have had in extending access to their entire populations. There are places where 40% of the population does not have access to these services, and where those who do have access to them do not use them. For this reason, there is a need to provide support for coverage studies that disaggregate the averages to identify the geographic areas or population groups that lack access. This is the only way to identify gaps that exist between the groups that have more and less access to the benefits of disease prevention and care.

There should be continued efforts to promote community interventions through local organization, mainly in the countries with higher peri-neonatal mortality. Toward this end, steps should be taken to identify neglected populations and make an accurate diagnosis of their needs and of the alternatives for providing coverage of necessary services. There should be an objective for each line of action proposed in relation to community intervention and surveillance and monitoring systems.

Each strategic area has lines of action with clear objectives. One objective is to promote the development of national plans, especially in those countries deemed priority and high-impact, always targeting the actions to the most neglected geographic areas and population groups. The priority countries include all those that contribute a large number of neonatal deaths to general mortality in the Region and that, in some cases, register rates of infant mortality much higher than the regional average. The latter group, with especially high mortality, includes Haiti, Bolivia, Honduras, and Guyana. Priority is also given to El Salvador, Guatemala, the Dominican Republic, Ecuador, Paraguay, Mexico, and Brazil because of their mortality rates in combination with their large absolute numbers of deaths (Mexico and Brazil above all, because of their very large number of live births annually).

The plan includes activities for each strategic area according to different epidemiological scenarios, targeting the interventions according to process, outcome, and impact indicators.

The first strategic area is creation of an enabling environment for the promotion of peri-neonatal health. One line of action within this area calls for promoting the development of national plans by 2010 to improve neonatal health in the countries of Latin America and the Caribbean that are considered priority and high-impact. Another consists of creating and strengthening alliances and partnerships so that by 2010, the priority and high-impact countries will have entered into partnerships with organizations that support implementation of the national plans.

The second strategic area, strengthening of health systems to improve access to maternal, newborn, and child health services, is being carried out through the promotion of universal equitable access to maternal and neonatal care, giving priority to vulnerable groups. The objective is that by 2012, the priority countries will have achieved at least 80% coverage of skilled care in childbirth. A second line of action is to update, disseminate, and implement maternal and neonatal health care interventions so that by 2009, all priority and high-impact countries will be implementing evidence-based standards and procedures of neonatal care as part of the continuum of care and treatment.

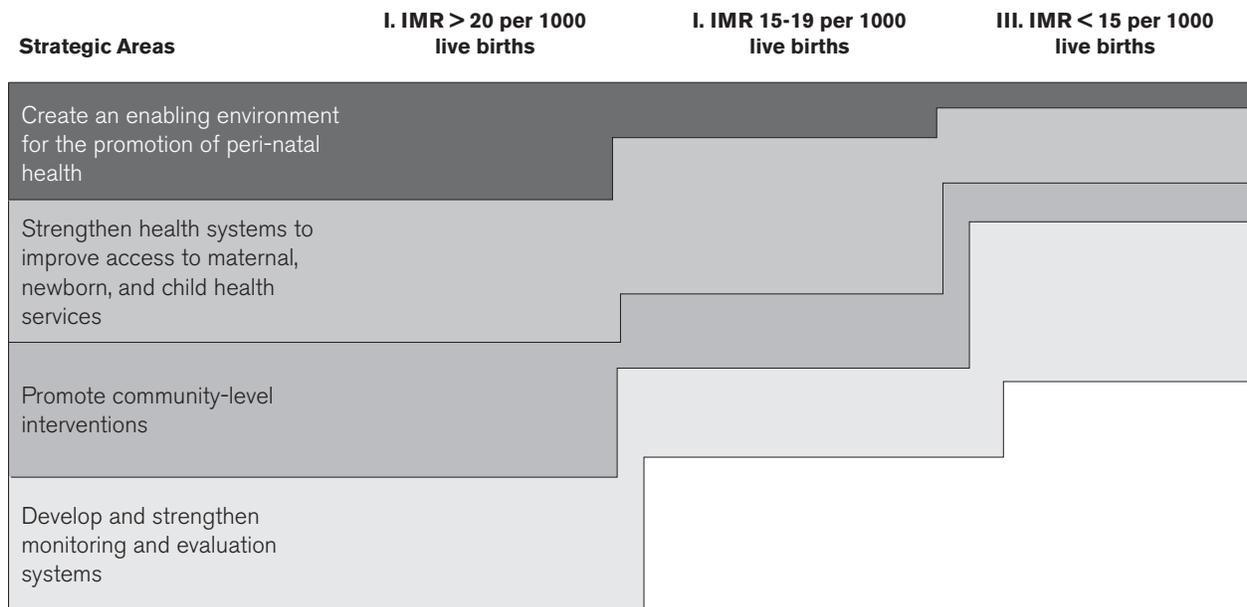
The promotion of community interventions, which is the third strategic area, is being incorporated within the national health plans for the improvement of neonatal health. By 2010, these plans should include instruments for strengthening the skills of community health workers and other social actors so that they can support the care provided within the framework of the continuum. This strategic area also includes community mobilization activities and communication strategies to promote healthy behaviors; toward this end, the countries should have communication and social mobilization strategies in place by 2010.

Finally, the fourth strategic area is the development and strengthening of surveillance, monitoring, and evaluation systems. Toward this end, steps should be taken to improve health information systems, ensuring that by 2010 the priority and high-impact countries will have information systems that generate quality data on the situation of maternal and peri-neonatal health. This process will also facilitate the establishment of surveillance, monitoring, and performance evaluation systems within the framework of the continuum of care, so that by 2010 these same countries will have implemented systems for monitoring the performance of the health workers as part of their standard mechanisms of monitoring and surveillance.

Based on the Regional Strategy and Plan of Action, all the countries are developing the activities and indicators within each strategic area, following a double-entry matrix (Figure 2) that relates the different epidemiological scenarios to the infant mortality rate. This same approach can be used within each country for the purpose of adapting the activities and indicators to the different epidemiological and operational realities of the different sites, revealing those activities that prove more effective in addressing the problems characteristic of each geographic area and population group.

Within the framework of the process already underway in the countries, which will be extended progressively throughout the Region, PAHO is serving as a catalyst for securing financial and technical resources at

Figure 2. Regional Strategy and Plan of Action
Activities and Indicators for each Strategic Area according to the different epidemiological scenarios



both the regional and national levels, with a view to strengthening the essential public health functions in the countries of Latin America and the Caribbean. This process requires the participation of external and internal actors through interprogrammatic efforts that employ a multisectoral approach.

The health sector's response to neonatal care within the framework of the continuum of care will emphasize the training and upgrading of human resources; the development and adaptation of standards, guidelines, methodologies, and tools; and the dissemination of information, including information on evidence-based interventions and best practices of care. Furthermore, the mechanisms of PAHO technical cooperation with the countries, as well as the coordination of horizontal technical cooperation between countries, should bring high visibility to neonatal problems within the continuum of care and highlight the possibilities for effective intervention. This can help in mobilizing resources in every country and generating the political, social, and economic support needed for the implementation of actions under the Regional Strategy and Plan.

Unifying the efforts of multilateral and bilateral organizations, the private sector, scientific and academic institutions, NGOs, faith-based organizations, and civil society will help sustain attention to the issue and create an enabling environment for achievement of the Millennium Development Goals related to maternal and child health. Toward this end, it is essential to continue to strengthen existing partnerships and look for new partners in order to mobilize resources from the entire community that can support the design and implementation of programs to improve the health of women, mothers, newborns, children, and adolescents.



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When we look specifically at the role of health care organizations in resiliency, there are five things that become more relevant: surveillance, coordination and communication, training, protective equipment and surge capacity.

5

Experiences with Hurricane Katrina and actions of the Texas Children's Hospital during the Hurricane Ike emergency

Dr. Joan Shook

Chief Safety Officer and Co-Physician in Chief
Texas Children's Hospital

Our approach as an institution to three rather remarkable hurricanes that we passed in Houston in the last three years has evolved: the first one being Katrina, which happened three years ago last month, where we had a city-wide and region-wide response; then shortly thereafter we had a second hurricane, which was called Rita, where we had a lot of problems; and last month we had Ike and we were able to fix our problems. I hope you will see this evolution with me.

As you know, disasters are nearly inevitable. With climate change and coastal developments, hurricanes and flooding are increasing in this country and nearby as well. Wildfires are a huge issue around the globe. Earthquakes are a big problem for all of us as well. Pandemic flu is behind us all the time and is inevitable; we know that pandemic flu is coming; we know that it will be a mass disaster - we just don't know exactly when. And terrorism, of course, is a threat for all of us.

The real key in managing these kinds of things is to develop national resiliency. We are working hard here to do that, although we certainly have a long way to go in terms of developing real national resiliency. But what it helps us to do is mobilize the means to reduce our vulnerability - so many vulnerabilities were pointed out clearly by our response to the hurricanes. It also increases our capacity to bounce back from a major event. There are several ways, but one is mobilizing public support; the public has to be involved in developing a resiliency response. It also helps us to develop community preparedness and national security support.

When we look specifically at the role of health care organizations in resiliency, there are five things that become more relevant: surveillance, coordination and communication, training, protective equipment and surge capacity.

Surveillance can be at many levels and for many things; at Texas Children's Hospital we do surveillance for biochemical and biological threats and we report those. Coordination and communication is a very difficult issue, as it is necessary to figure out how different institutions relate to one another and convey meaningful information across the continuum. Training is also a huge challenge since the kind of things that require training in the event of a disaster are often different from the day-to-day kind of work we ask people to do, and it is often difficult to get people's attention for this kind of information.

Personal protective equipment and system protective equipment is a fourth category that needs to be looked at in health care resiliency; and then finally surge capacity is one of the most important aspects.

Surge capacity is how you make what you have bigger in the event of having more patients for whom you have to care, and we have done that very effectively here to some degree. Surge capacity can be looked at in several different ways (Figure 1).

Figure 1. Surge capacity in health care

- > **Public health response**
 - Over-all ability to manage a large incident
 - > **Community based response**
 - Off-site facilities
 - Unified command structure
 - > **Facility based response: What is the excess number of patients that can be treated during a transient event?**
 - Surge in place
 - Early discharge
 - Double-up
 - Convert space
 - Staff with overtime, provide volunteer staff
 - Surge beyond walls
 - Alternative care facilities
-

First there is a public health response; the public health system can create a surge capacity as a way of handling patients more efficiently and handling a big event. Then there is a community based response, where you have to develop outside responses; for example, if there is a pandemic flu, the last place we want to manage it would be at the hospital, because everybody will end up being exposed and we would be making the epidemic worse. Rather, we would open an outside area in order to manage those patients. It is also important to have a unified response structure and command structure so that everybody is doing the right thing.

Finally, the facility based response is what I will give you some examples of in terms of how Texas Children's managed these events.

When we are talking about facility based response, one of the things that is particularly important to answer is, "What is the maximum number of patients that you can manage during a transient event?" You can manage them by early discharge, which we do; by doubling up patients and patient's care areas that you think are safe; and by converting space that is not really patient care space to patient care space. One of the very innovative things that Fernando Stein has done in the PCU is not only add extra head walls everywhere you look, but he also placed gases and suction and other medical supplies in the hallways so that if we are in a position where we really need to surge in place, we have a lot of opportunities to do that.

And then institutions also can surge beyond their walls by creating alternative care facilities.

Additional considerations include the coordination of the patient response, which is very difficult to do and requires practice more than anything else. For example, how does one get materials and supplies if you are in the middle of a flu epidemic, if all of your staff medication suppliers have influenza? How does one get medication, ventilators, and other materials to take care of patients? How does one get food and water, which is particularly relevant during a hurricane? And of course, in any of these events some of the resources will become scarce and you have to do the greatest good for the greatest number, which is a pretty tricky thing to sell to health care providers in these circumstances.

Our Hurricane Katrina response was a prototype for a community based response, supported beautifully by Texas Children's Hospital. In 2005, Hurricane Katrina hit New Orleans and approximately 1,300 people lost their lives, more than a million people were displaced, and 4500 people were reported as missing, although most of those were repatriated ultimately. Stephen Flynn wrote a very good book on the events that transpired after the hurricane and his impression was that the critical lesson was that major natural disasters are likely to overwhelm the state's capacity to respond – and Katrina certainly did that.

We were lucky in Houston that we didn't have the direct effect of the storm itself; rather, we had the effects of people coming here, which is why it fits in the category of a community based response. Figure 2 shows the floor of the Astrodome, a large athletic complex not far from here where we housed 27,000 people for about two weeks. These people were patients and individuals who came from New Orleans once the streets were open.

There are many details behind this. On the 29th of August the storm struck the Gulf Coast, and on the 30th New Orleans was flooded. You may remember pictures of people standing on the roof surrounded by 16 feet of water, and that very awful side of America that was shown to the world. On Wednesday the 31st, intensive evacuation of hospitalized patients was undertaken. Texas Children's Hospital, in collaboration with four other children's hospitals, flew multiple missions to airports outside of New Orleans to evacuate Neonatal Intensive Care Unit Patients, Pediatric Intensive Care Unit Patients and Acute Care Patients. We did a beautiful job; the patients all came and we absorbed about 100 additional patients at this hospital and other patients were sent to Dallas, to San Antonio, to Oklahoma and all around. I wish I could say it was a good experience -and it was because we saved people's lives - but it was very messy. I flew in a mission outside of New Orleans where we took 17 people and plenty of equipment and supplies, and we waited for six hours on the ground because the coordination and communication with New Orleans was completely lacking.

Figure 2. Houston's Katrina Experience:
Creating surge capacity



Ultimately the pediatric patients were evacuated and we were then able to focus on evacuating civilians. Evacuation began on September 1st; buses arrived in Houston within 24 hours and we had 27,000 people in the Astrodome. The thinking was that the county hospital district, in collaboration with the Public Health Authority, would take care of all of those individuals, but very quickly the number of patients outstripped their capacity to respond. And so we set up a small clinic and as the patients continued to come we realized that 30% of the 27,000 people had chronic health needs that had not been addressed for five days and so they needed immediate assessment. Very quickly complaints were being broadcast on TV in the middle of the night on Thursday that more doctors were needed.

One of my colleagues and I showed up at 12:30 in the morning and that began the experience.

We opened a separate clinic for pediatrics, as well as another area. The patient number was very high: we saw about 400 children a day. At first the County Command Group was reluctant to allow our participation because we were not part of their command structure. But then one of the very skilled people in my group, Dr. Paul Serva, was able to communicate clearly with them, show them the value of what we were bringing and we were able to open up this additional clinic space for children only.

We worked together with the hospital to provide support and the administrative leadership here gave a lot of resources. Paul Serva became the Medical Director of that clinic area; our pharmacy created an on-site pediatric pharmacy. The adult clinics really had no pharmaceutical support for a while. And then Texas Children's Hospital warranted staffing supply and equipment for the clinic. This was a terrific example of community response and our hospital understanding its key role in that.

Texas Children's Hospital also supported the central supply of all our materials and IV fluids; everything we needed to take care of all these children was supplied by the hospital, as was the nursing staff and the administrative oversight staff.

We had a huge outbreak of diarrhea, which was not surprisingly given that people were walking through hurricane waters that were contaminated with sewage. One of the additional things we were able to do was develop isolation shelter in an adjacent building where we cared for more than 400 patients at a time. Because the nature of the illnesses is fairly self-limited, we were able to allow them to be isolated and they were able to promptly rejoin their families in Astrodome area.

For the following 10 days we saw about 400 children a day. We had good lab services that the county supplied for us. Texas Children's Hospital was able to arrange for a subspecialty follow-up for the patients who had complicated illnesses. We had social workers and psychiatric counselors available.

One of the big problems we ran into was how to identify people who said that they were physicians or nurses and how to make sure that they were, in fact, what they said they were. I worked a full day at the Astrodome and toward the end of that day there was a patient who was seizing - a pretty routine kind of seizure - and a person who I thought was a nurse the whole day became hysterical, screaming, "What is going on with that man?" I said it was a seizure and not a big deal and she replied that she was a physical therapist and had never seen that before. So I had been working with a woman all day thinking she was a nurse and she was not. After that we worked really hard in identification.

The second week we changed from 24 hours/seven days to just 12 hours a day and Texas Children's Hospital, because we saw a decrease in the number of patients seen, let the staff leave and we were able to go back to county staff.

We closed the clinic exactly two weeks after it was opened and patients that needed further medical attention were screened out to other regional support areas.

That was, in summary, our experience with Hurricane Katrina, and I think it was really successful. I think it was Houston at its finest hour. Figure 3 summarizes the benefits of the intervention.

We registered more than 35,000 children, although we saw many more than that because many children that needed specific care did not register and simply were evaluated and given over-the-counter medication. We transported only 50 children to this campus, even though it was a mile away, so we really were able to manage everything on site at the Astrodome and we never experienced overcrowding or had to go on diversion for our hospital. That was a huge win for this institution by providing on-site service. The cost to Texas Children's was the temporary loss of several key people and also some financial costs, although we were able to reclaim those costs fairly quickly with private philanthropy because the community endorsed the work that the hospital had done. It was easy to get that reimbursement from some key community leaders.

Figure 3. Why did TCH do it?

> Benefits

- > 3500 pediatric patients seen in 14 days
- < 50 pediatric patients transported to area hospitals
- TCH inpatient units never experienced overcrowding
- TCH Emergency Center never went on divert

> Costs to TCH

- Pérdida temporal de varios empleados clave
 - Costos económicos
-

Two weeks later we were confronted with Hurricane Rita. It was different than Hurricane Katrina in that it was a category 5 storm; at the time it was the third most intense storm that had ever been recorded and was headed directly for Houston. We had a very different look at that and frankly, our community panicked. I think that is understandable because Katrina was so devastating and we had so much contact with Katrina refugees.

In a very disorganized fashion, more than 2.5 million people evacuated the Texas Gulf Coast and 24 people died during that evacuation because the roads were jammed. It was extremely disorganized and not completely thought through.

We decided rather than to surge in place that we would evacuate portions of our NICU, our PICU and our Cardiovascular Intensive Care Unit. As soon as we emptied out our beds, a number of children who were home on ventilators suddenly appeared on our doorstep because we had not considered that those families would not know how to manage the situation. They were frightened, they saw the threat of the storm and so they arrived with their suitcases and their ventilators to spend the storm here.

Additionally, we had the problem of medical staff, hospital staff and countless others - people we did not even know - who arrived at the hospital looking for shelter. That was a problematic situation and we could not even count the total number of people who came here for the storm.

Very fortunately for us, but not for the people who actually had been affected, Rita veered north and then missed Houston. But the experience showed us many problems with the way we manage these kinds of events.

There was a general consensus that our response needed to be improved and the state Department of Health hired a consultant group to analyze the response to Hurricanes Katrina and Rita. It was a four month interview process. Although thousands of people around the state were interviewed, not a single pediatric provider of any kind was interviewed during the initial evaluation.

Fernando Stein has been very active in the American Academy of Pediatrics and our local group here, the Texas Pediatric Society, and through that organization pediatricians demanded a voice. When the final report came out, many pediatric-specific indicators were included, but it was quite a struggle to get there. Included in those pediatric-specific indicators are:

- > Emergency responders must use pediatric-specific emergency care guidelines
- > Special considerations need to be taken for children with special health care needs
- > Family services needed to have been involved in the shelters (we had a problem, for example, during Katrina because many children arrived alone, with no adults at all, and the community volunteers took them home)
- > Age-appropriate supplies had to be involved

We had a lot of time to work on our community response, on our state response and on our hospital response. Then, on September 12th, Hurricane Ike came our way. What was impressive about Ike was the way that we learned from what we had done before. There was a very clear statewide coordination of evacuation and repatriation of vulnerable populations. Transportation was supplied in many dimensions by the state and availability was known statewide so we received constant updates on where and what kinds of beds were available, and how you could get your patient there. Special needs shelters for both adults and children were set up here and in many other places (Dallas, Lubbock, San Antonio) to get patients with chronic health care needs cared for in the advent of the storm. The state Department of Health opened a state response on September 8th – remember that the storm did not come until the 12th; one of the nice things about a hurricane is that you have a little bit of warning. Then regional teams were set up all throughout the state to monitor and respond to local conditions.

Ike was a category 2 storm but with a huge wind field. In a very systematic way we evacuated 1 million people from the Texas Gulf Coast over a 36 hour period. The state demanded that different zip codes be evacuated in a certain period of time and it went extremely smoothly.

We made the decision here that we would shelter in place with an in-patient census of 423. We stockpiled water, fuel, generators and food.

As we decided to surge in place, we housed 2,500 people, medical staff and employees who came in to stay here during the storm (Figure 4). The ambulatory care building, the CCC, was converted into a hotel, and had sleeping accommodations for 700 people per shift, so there were three eight-hour shifts of sleeping where one person would get up and somebody else would sleep in that bed.

Medical staff and a few others were able to sleep in other parts of the hospital. We also opened a child health facility for individuals who had to work and had no options for child care. We staffed that with child life and volunteers, and we had 200-250 children here for the duration of the storm cared for by these people.

Our nutrition services distributed 2,500 meals three times a day in addition to the meals for the patients and their families, so it was really 3,500 meals three times a day for the duration of the storm. We evacuated

Figure 4. Hurricane Ike: TCH surge capacity

- > **2500 medical staff members and employees reported to staff the hospital during the storm**
 - > **Ambulatory care building converted into a “hotel” with sleeping accommodations for 700 people per shift**
 - Opened a child care facility, staffed by child life, which cared for 200 children ages 2-17
 - Nutrition services distributed 2500 meals 3x/d
 - > **Evacuated 17 bed CVICU to from 18 to 3**
 - > **Hospital lost windows and some leaking—no patient harm**
 - In intermediate care area, moved patients to hallway stations where medical gases available
 - > **City of Houston lost water pressure**
 - Hospital had to rely on bottled water
 - Showers rationed
 - > **Ride-out team released after 60 hours when Recovery team came in**
-

our 17 bed CVICU from the 18th floor down to the 3rd floor without incident, and actually TCH did very well during the storm, although we were pretty close to a direct hit.

We lost some windows and we had some leaking, but there were no patients harmed. The intermediate care area did a superb job in planning; we pulled patients from their rooms because there were some broken windows and set them up with their suctions and their ventilators in the hallway. This was a wonderful thing and the patients and their families were extremely grateful. They really felt no anxiety about it, although I was terribly anxious.

The city of Houston lost water pressure and we also had our water supply contaminated, so we relied completely on bottled water for about two days. We had to rationalize its use so we did not have many showers around here.

The ride-out team was released after 60 hours, when the recovery team came in.

We had about 72 deaths. I heard on the radio this morning that we had one more, so that number is probably a bit higher. We still have 400 people missing, most of whom are likely dead after the storm surge. About 4 million people in the greater Houston area lost power and the total damage exceeds 30 billion dollars, the third costliest hurricane in US history.

The cost to TCH was about 2.1 million dollars, related to the human resources and the recovery team that were sent, as well as all the needed supplies.

Were we better than with Rita? You bet we were. We took great advantage of those years: State emergency management began earlier; mandatory evacuation was very smooth and included the evacuation of five hospitals; the transportation for the patients of those hospitals was arranged by the state; and there was intensive coordination of state health services, including the previously managed special needs shelters.

Although we did much better this time, we have a lot to learn even still. These are the levels of a disaster response:

- > Preparedness is obviously the key;
- > Responding and then learning from your response is second;
- > Mitigation is the third level; and finally
- > Recovery. Houston has largely recovered from the experience although there are still some problems.

Preparedness (Figure 5a) includes intensive meetings with hospital planners and others to ensure children's health care needs are met; the medical community needs to be intensely organized with a proper distribution of expertise; education of the families needs to be done and long term care facilities and schools are also critical in the coordination of this response.

Figure 5. Preparedness

- > **Meet with hospital planners to ensure that children's needs will be met**
- > **Organize the medical community to ensure appropriate distribution of expertise**
- > **Develop educational packets for families**
 - Pay special attention to CSHCN, technologically dependent patients, frail elderly
- > **Work with hospitals, LTC facilities and schools to develop decision trees for initial steps to take**

Patients and their families need to understand exactly what they have to do, and that was a big change between the response to Ike compared to Rita. We got no ventilated patients this time, while we had 24 the first time, because our families understood what the response needed to look like and where they needed to go.

There is a set of wonderful websites: the Red Cross has a terrific website and the American Academy of Pediatrics has a terrific disaster's website now that you may look at for more information.

Strategies have to be developed to minimize parent-child separation and reunite the families, which was a huge problem during Katrina but not so significant during Ike or Rita.

Families with special health care needs need further education including how they should manage their technologically dependent children and where to procure medications and supplies. Immediately after Ike we had lots of patients coming in and wanting additional medication because they lost refrigeration and other things; family members need to be trained should they not be able to get assistance caring for their children.

The hospital has a lot of issues that need to be addressed on an ongoing base after the storm, including the following:

- > Securing the physical site
- > Procuring the necessary supplies, food and other essentials
- > Securing the availability of essential personnel
- > Developing effective communication
- > Devising appropriate leadership structure
- > Assessing patient evacuation and transport issues

Recovery is the next phase. We have many patients in this Region who are in chronic renal dialysis; many of those individuals lost their site for renal dialysis during the storm and it was a very difficult for them to get that resource, presenting to emergency departments in large numbers hoping that we could provide dialysis but we cannot.

In spite of everything I think we learned a lot. We were a lot better than we used to be but we need to continue to work here at least to practice our response because disasters are not predictable, but we do know they are going to happen. We are absolutely in line for hurricanes, and I am sure that we are in line for other things as well.

Planning is the key to all of that; relationships are of paramount importance because a lot of what happens during the storm has to be organized on site and people need to know what to do in every moment. Involvement of everybody who cares for children is essential, otherwise children are completely lost in the process and will be disproportionately harmed if we are not there to speak up for them.

6 Importance of the political process for adaptation of the IMCI strategy in national policies: The example of Argentina

Dr. Juan Carlos Bossio

Consultant

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The implementation of new strategies in the health sector depends on multiple factors that can either encourage and accelerate the incorporation of the strategies or discourage and delay their application. Argentina was one of the Latin American countries that participated from the beginning in the process of regional implementation of Integrated Management of Childhood Illness (IMCI). In Argentina, different actors within the health system promoted the incorporation of the IMCI strategy. This resulted in a series of advances that led to the development of policies that were implemented in the short and medium term.

Argentina began a process of adaptation of IMCI from the moment the strategy was first presented by the Pan American Health Organization. Although it is not among the countries with higher infant and child mortality, Argentina participated in the Regional Course offered in Peru, which was intended principally for the countries of the Andean Region and Central America.

After that course, Argentina developed its adaptation of the strategy between 1997 and 1998, although some of the country's 24 jurisdictions (23 provinces and the Autonomous City of Buenos Aires) undertook their own adaptations and began the process of implementation.

A number of different stakeholders in child health participated in adaptation of the strategy, especially the academic institutions that train health workers (mainly the medical schools) and the scientific institutions (mainly the Argentine Society of Pediatrics). The medical schools carried out work on the IMCI strategy, developing materials to incorporate it into undergraduate education and, from 1997 on, offering regional and international courses of clinical training in application of the IMCI strategy in the country.

In the years since then, numerous courses have been offered, and the IMCI strategy has been progressively incorporated in the instruction offered by many medical schools in the country, as well as in outpatient care provided by the health services. The strategy has also been treated as a subject of interest in scientific and academic conventions. This has contributed to broad dissemination of the strategy, initially in the field of pediatrics and extending subsequently to the fields of general medicine, family medicine, and community medicine.



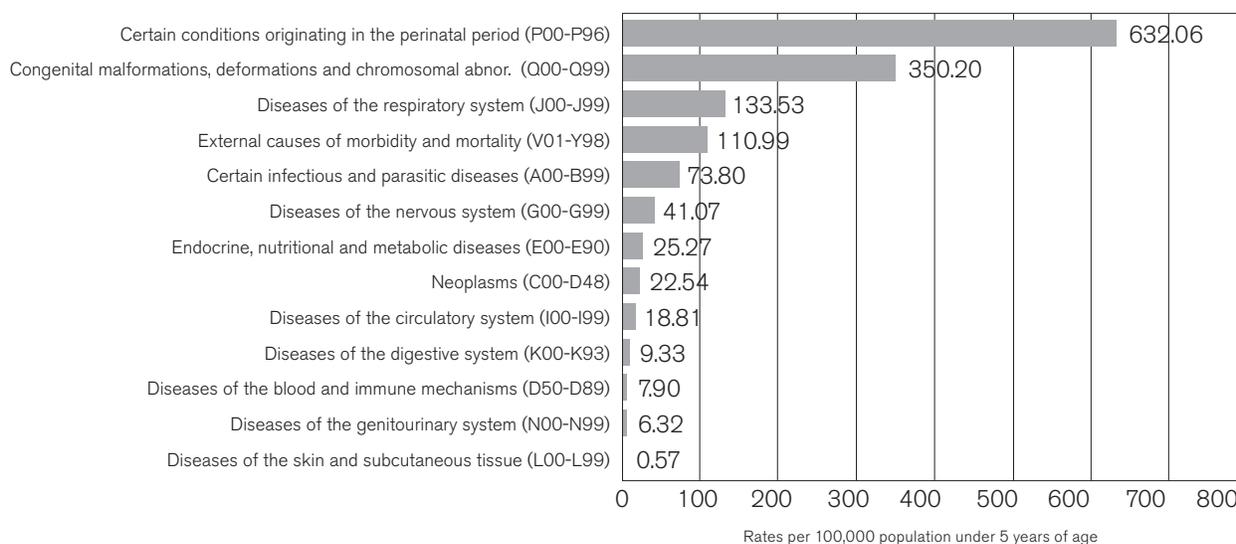
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The strategy has also been treated as a subject of interest in scientific and academic conventions. This has contributed to broad dissemination of the strategy, initially in the field of pediatrics and extending subsequently to the fields of general medicine, family medicine, and community medicine.

At the same time, the Argentine Ministry of Health began development and adaptation of the IMCI strategy in order to incorporate it into the education of community health workers, especially in areas of the country with higher infant mortality rates. However, no specific plans were made for application of the strategy by medical professionals, which remained the responsibility of the pediatrics departments in the medical schools.

This entire process unfolded in a context where, then as now, infant and child mortality was below the regional average and 60% of mortality in the first year of life was due to perinatal causes, either disorders specifically related to the perinatal period or congenital malformations (Figure 1). This epidemiological situation did not favor immediate acceptance of the IMCI strategy as a tool for achieving the country's goals for reduction of infant mortality; since the leading causes of death during the first year of life were associated with the perinatal period, strategies were required to improve care and treatment during pregnancy, childbirth, and the neonatal period.

Figure 1. The child health situation in Argentina
Principal causes of mortality in children under 5 years of age.
Rates per 100,000. Argentina, 2006



Source: Instituto Nacional de Enfermedades Respiratorias (INER) "Emilio Coni" based on data from the National Bureau of Health Statistics and Information, Ministry of Health, Argentina. February 2008.

Another important factor that influenced the implementation of the IMCI strategy in the country was the organization and operation of the health services that provide care to children.

In general, a high level of specialization exists throughout the country's network of health services, both public and private. In particular, there is a marked dominance of physicians throughout the health structure, with a greater number of physicians than nurses in nearly all jurisdictions.

Furthermore, children's health care is provided primarily by pediatricians, a pattern common to most outpatient health care services in the country's large cities.

The managerial structure of care is also dominated by physicians and especially by specialist physicians, with very limited presence of other health professionals. In terms of the level of service, in Argentina as in many countries, the hospital level takes precedence over the network of outpatient health services. And among hospitals, the most complex and specialized institutions have greatest influence over the allocation of resources and the formulation of health plans and policies.

This situation creates intense pressure for the incorporation of new diagnostic and treatment technologies, for reliance on hospital-based services, and for the diagnosis, treatment, and monitoring of cases by specialists.

These structural factors, along with others, contributed to a preference for specific strategies that target the diseases that cause mortality in children after the age of 1 month, mainly acute respiratory infections, without integrating these approaches into the IMCI strategy. At the same time, the dominant role of specialist physicians was a factor that influenced the decision not to use the IMCI strategy in outpatient primary care, since it was assumed that the high level of training and specialization of medical professionals in these services would ensure high-quality care.

Furthermore, it should be noted that although the strategy of primary health care has been adopted and promoted in many jurisdictions, its degree of implementation is variable. In general, the hospital sector, and especially the most specialized segment of that sector, has the highest profile and plays the key role with respect to both the allocation of resources and the definition of lines of action for the implementation of plans and strategies.

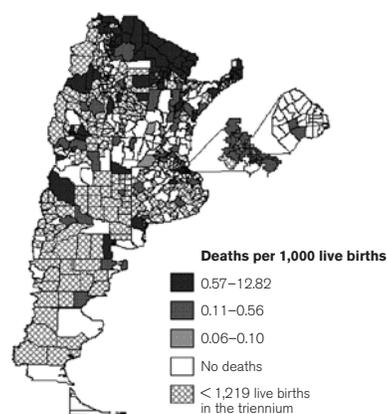
Nonetheless, these factors related to the operation of the health services and to the general situation of infant and child mortality in the country coexisted and continue to coexist with other factors favoring an important role for the IMCI strategy in improving the health of children under 5.

The first of these is the growing awareness in Argentina of the health inequalities that exist between the different provinces and, especially, between the different departments into which the provinces are divided. Since the end of the 1990s, and more regularly since 2000, various analyses have been undertaken to identify the geographic areas of Argentina with higher infant mortality, and specifically those where children have a greater risk of dying before 5 years of age from child health problems such as intestinal infectious diseases or diseases of the respiratory system (Figure 2).

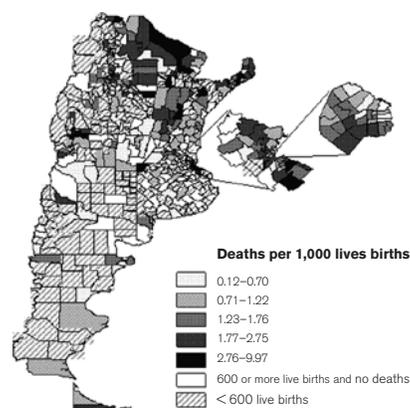
Improved analysis of information about the interior of the country made it possible to identify the areas that have greater mortality from diseases that can be prevented, detected early, and treated effectively through use of the IMCI strategy. These include the intestinal infectious diseases and diseases of the respiratory system, mainly pneumonia and influenza, which in many of the country's departments contribute to under-5 mortality rates that are several times higher than the national average.

Figure 2. Inequalities in the health situation of children in Argentina

Mortality from intestinal infectious diseases in children under 5 years of age. Republic of Argentina, by department, 2002–2004 triennium



Mortality from diseases of the respiratory system in children under 5 years of age. Republic of Argentina, by department, 2005–2006 biennium



Source: Instituto Nacional de Enfermedades Respiratorias (INER) “Emilio Cani” con base en datos de la Dirección Nacional de Estadísticas e Información de Salud. Ministerio de Salud, Argentina. Febrero 2003

These areas were not only found in the provinces that have traditionally registered higher child mortality. When mortality was disaggregated for the areas within each province, high-mortality areas were detected in many of the provinces in the central region of the country, where provincial rates are below the national average, and even in the Autonomous City of Buenos Aires. Specific neighborhoods of the capital were found to have relatively high mortality rates in children under 5 from respiratory diseases, but these elevated rates were masked by the average for the whole jurisdiction and by the national average.

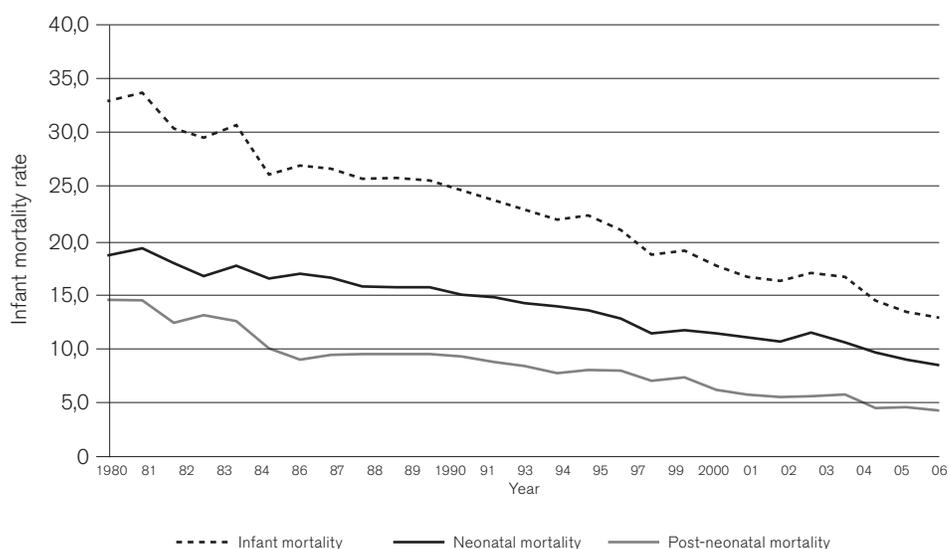
This type of analysis by the Ministry of Health was increasingly a topic of discussion in all the pediatric conventions, raising awareness of the patchwork of different situations that lay behind the general profile of the country with regard to child mortality.

The second factor favoring adoption of IMCI was the realization that certain preventive interventions being carried out in the country showed patterns of inequality similar to the one that was observed when mortality was disaggregated by province and by department. For example, although national vaccination coverage is adequate, it was found that a large number of departments not only did not reach vaccination targets but had coverage far below the expected level. This situation led the Ministry of Health to set specific vaccination targets both for the first year of life and for school admissions, stating specifically that the targets should be reached not only in terms of the national average but also in each province and department, in order to drastically narrow the gap between areas of the country in relation to the preventive benefits of vaccines.

Finally, a relative stagnation was observed in the decline that had been registered in postneonatal mortality in recent years (Figure 3). It was also noted that most of the continuous reduction in infant mortality in these years occurred at the expense of the reduction of neonatal mortality.

Along with these types of factors, one must consider the process of introduction, adaptation, and development of the IMCI strategy, which, as noted above, took place largely in the pediatrics departments of the medical schools. In many of the country's universities there was a gradual incorporation of IMCI into graduate-level courses in medicine, both in the pediatrics departments and, also gradually, in the final year of compulsory practice.

Figure 3. Rates of infant, neonatal, and post-neonatal mortality per 1,000 live births. Republic of Argentina, 1980-2006



Source: National Bureau of Health Statistics and Information, Statistical Yearbook 2006. Ministry of Health, Argentina, 2007.

Importance of the political process for adaptation of the IMCI strategy in national policies: The example of Argentina

As a result, each year saw the graduation of a critical mass of physicians whose training included clinical courses on the IMCI strategy. A growing number of graduates opted to carry out research projects designed to expand knowledge about child health from a community perspective, as well as to document the benefits of IMCI in improving the quality and outcomes of care provided to children in primary health care services.

Also in recent years, the Ministry of Health has strengthened the primary health care approach by creating specific programs to upgrade, in both quantity and quality, the human resources that provide first-level care, and it has expanded the coverage of special programs to improve the quality of care during the first years of life.

All these factors together led to the incorporation, in 2008, of the IMCI strategy together with national plans for control of tuberculosis and Chagas disease as three central lines of work of the Ministry of Health. These three priority areas were assigned to the Undersecretary of Prevention and Risk Control, who is responsible for a large number of health programs.

The implementation of the strategy was to take place through the National Program of Community Physicians, which comprises three subprograms: Community Physicians, Family Doctors, and the Program on Indigenous Peoples' Health. The National Program, which has 6,000 health professionals, adopted IMCI as the central strategy for care of children by all its professionals.

The strategy was also adapted for incorporation into the indigenous peoples' health program and is being incorporated into the health residency programs that are financed by the Ministry of Health, especially in the areas of general and family medicine.

Throughout this process that began with the introduction of IMCI as a strategy, certain factors stand out as key contributors to the end result—the incorporation of IMCI as one of the guidelines for actions in child health.

In the first place, with respect to the external context, one can point to PAHO's role in sustaining and expanding the IMCI strategy in recent years, with the continuous development and production of materials documenting the experiences and outcomes of the application of IMCI. This allowed health professionals, especially pediatricians, to keep up with advances in implementation of the strategy. In addition, access to international and regional training courses led to the sharing of experiences among different countries. The expansion of the content of IMCI was a key factor in bridging specific gaps in outpatient health care for children, which occur with differing frequency in the various countries. In this respect, we should note the addition of components related to care of obstructive respiratory problems and to the assessment of development, and, in particular, the development of the peri-neonatal component of IMCI. This has expanded coverage of the strategy and tailored it more closely to the profile of childhood morbidity and mortality that is found in countries with average or low infant mortality, where peri-neonatal problems are the leading cause of death before 1 year of age.

Also of importance was the redoubling of international efforts to set and evaluate goals for child health, which highlighted the need to focus on actions to reduce mortality during the first years of life. This international process, together with the increasingly strong response of IMCI to the entire range of child health problems, helped reinforce the strategy's importance for developing countries seeking to accelerate their rate of reduction in under-5 mortality.

With respect to the internal context, three factors stand out as key in promoting IMCI as a strategy with great potential to improve child health conditions:

- The creation and maintenance of a critical mass of health professionals trained in the IMCI strategy, basically through support for national training courses and the incorporation of the strategy into instruction in a high proportion of the pediatrics departments in medical schools.

- > Continuous work with the universities and academic institutions that train health workers, which strengthened IMCI as an evidence-based strategy.
- > Promotion of the IMCI strategy in the health agenda through the execution of epidemiological and operational research; through the presentation of experiences in the application of IMCI in conventions on the teaching of pediatrics and general, family, and community medicine; and through the continuous updating of the situation with respect to infant and child morbidity and mortality, with special emphasis on the identification of areas with high mortality rates.

7 The role of social pediatrics in children's health care



Dr. Manuel Katz

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The social pediatrics approach has changed in recent years, and the definition of the term has undergone numerous revisions. There has been a continuous evolution in the understanding of what social pediatrics means for the role of pediatricians in community and hospital settings and how it shapes the physician's approach to patients, their families, and their environment. According to the European Society for Social Pediatrics (ESSOP), the social pediatrics approach calls on health professionals to think and act locally and globally to improve the health and well-being of children and young people.

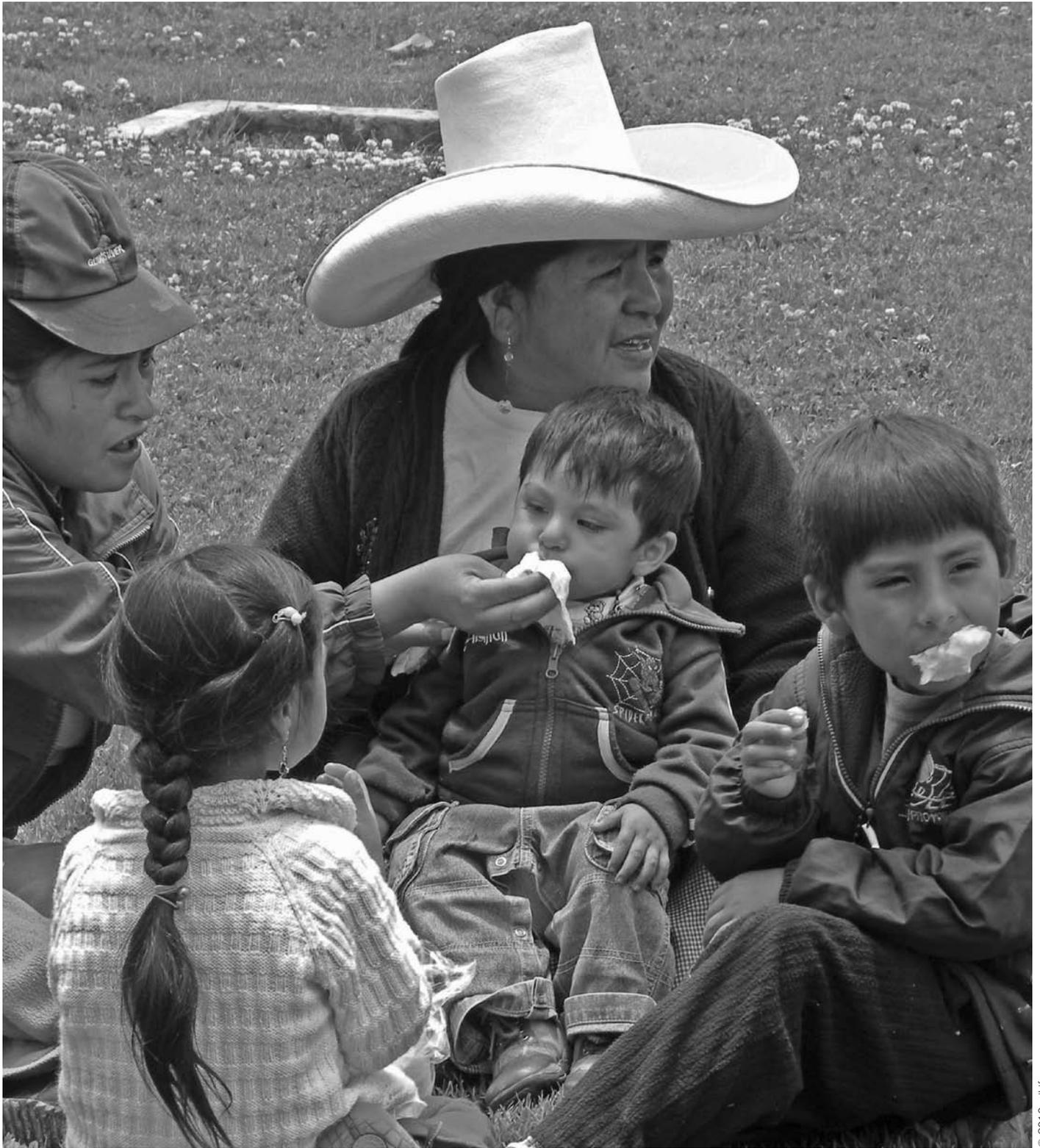
Toward this end, ESSOP has been working for several years to coordinate efforts at the international level and forge alliances with scientific organizations in several countries to strengthen the social pediatrics approach and expand its application, now and over the next 25 to 30 years.

The central idea is that there is no social pediatrics specialty per se; rather, the concept of acting both locally and globally should be incorporated at every level of pediatrics practice. This means that whenever a pediatrician sees a child, anywhere in the world, he or she should see that child in the context of the child's environment, which may give a different and unexpected meaning to aspects of the clinical history. The idea is to think globally, act locally.

The social pediatrics approach, then, is based on three main precepts:

- > Health risks during infancy and childhood are closely related to social determinants.
- > The health problems of children always have social consequences, in one way or another.
- > Care and treatment of children's health is carried out within a social framework.

On the first point, it is essential to include social determinants among the relevant factors in considering the health status of every child. This enables pediatricians to reach a more precise diagnosis and initiate treatment, disease prevention, and health promotion measures that are appropriate to the family's real circumstances. This may lead to different forms of management of the same disease in different children, or in different social contexts. Thus the pediatrician must recognize these differences and take them into account in making decisions.



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The central idea is that there is no social pediatrics specialty per se; rather, the concept of acting both locally and globally should be incorporated at every level of pediatrics practice.

Second, the health status of every child has a strong influence on the child's family and social group. Both health and illness have a strong impact on the family dynamic, and a change in this dynamic in turn affects the entire community. For this reason, the pediatrician should regard children's health problems as problems that are going to affect the well-being of the family and the community in some measure. As a result, care that is provided to address a specific problem should be accompanied by recommendations and actions intended to support the family's capacity to promote the child's health, growth, and development.

Third, pediatricians care for children within a social framework that determines—through working conditions, the definition of levels of complexity, the allocation of resources, and the organization of health services—the society's vision of child health, and to what extent that vision promotes disease prevention and health protection for children in the family and the community.

These three key precepts underlying the social pediatrics approach have evolved over the last few decades. During this period the approach to pediatrics has changed—from a disease-centered approach to one focused on health protection and promotion; from a predominantly individual-centered approach to one that considers health in the broader framework of the family and community; from an approach based on diagnosis and treatment of disease to one that seeks to identify the determinants of poor health and take actions to prevent illness and foster healthier habits and behaviors; from an approach that privileges biomedical data to one that pays attention to diverse social, environmental, ethnographic, and anthropological factors; and from an approach centered on a single physician to one that incorporates other professionals in order to develop a multidisciplinary vision of children's health care.

The pediatrician is in an ideal position to promote these new approaches and their incorporation in society's vision of health care. As a result of the evolution that has taken place in the field of social pediatrics, there is more frequent discussion of problems related to family, school, community, and culture as key elements affecting the health of the population. Pediatricians increasingly take part in family discussions about the care and health of children.

Immunization is a good example of an area where pediatricians have influenced family and social dynamics with respect to health care. Immunization programs have led to the eradication of certain diseases such as smallpox and to the elimination of certain others, such as poliomyelitis, measles, and rubella, especially in the Americas.

Other programs and actions that pediatricians have incorporated systematically into the care and treatment of children, using the social pediatrics approach, have also strengthened the role of families and communities in protecting children's health. These include interventions aimed at the early detection of developmental problems in children so that the child's growth and nutritional status can be monitored and timely decisions made about stimulation and feeding. Pediatricians can help identify the special vulnerabilities that affect some children, whether biological, psychological, family-related, or social; this then permits the analysis of feasible interventions that are adapted to the circumstances of each family and community and that can be applied in home, school, and community settings.

All these changes are consistent with shifts in the orientation of health care in general and pediatrics in particular during recent decades and, in particular, at the beginning of the new millennium (Figure 1).

Figure 1. Changes in the orientation of health care and pediatric care

<i>Pediatrics in the 20th century</i>	<i>Pediatrics in the 21st century</i>
FOCUS OF CLINICAL KNOWLEDGE	
Infections/syndromes, behavior and development based on empiricism	Genetics/environment, behavior and development based on neuroscience
ACCESS TO AND APPLICATION OF KNOWLEDGE	
Delayed (months/years)	Immediate
CONSISTENCY OF CARE	
Highly variable – depends on the individual provider	Highly reliable – evidence-based systems of care
RESPONSIBLE FOR CONTROL OF CARE	
Physician	Patient and his/her family
PLACE WHERE CARE IS PROVIDED	
Inpatient or outpatient health services	Inpatient or outpatient health services or the community

As part of this new approach to health care in general and pediatric care in particular, increasing emphasis has been placed on the need for early stimulation. Stimulation improves the prospects for healthy development in infancy, childhood, and adolescence, and makes it possible to detect developmental problems in children at an early stage.

Pediatricians play a key role in this process, as professionals who are in regular close contact with families from the beginning of a child's life. Working with the family and the community, pediatricians can promote greater child stimulation and ensure that delays in a child's development are detected early so that timely interventions can be implemented.

Using the social pediatrics approach, moreover, professionals can identify protective factors and risk factors in different areas of the child's life. These include the factors typically evaluated in assessing a child's condition, but they also encompass those related to parents and other adults who live with and take care of the child; the lifestyle and practices of the family with respect to diet, recreation, and education; the environment in which the child lives, plays, and grows, including the institutions that provide child care (day-care centers, schools, clubs); and the characteristics and predominant culture of the community where the child lives.

The search for these protective and risk factors is an essential part of the social pediatrics approach, helping to prevent threats to children's health that can negatively affect their growth and development (Figure 2).

Figure 2. Effects of poverty on the health of children from 0 to 3 years of age

Children living in poverty are less likely to:	Children living in poverty are more likely to:
> Be breastfed	> Have low birthweight
> Receive timely and complete immunizations	> Show developmental delays
> Receive good health care	> Have a high rate of injuries
> Have regular access to health services that provide high-quality care	> Have growth below their genetic potential
	> Experience frequent hospitalizations
	> Show behavior disturbances

There is growing evidence of the importance of providing good-quality care during the first months and years of life, since this permits the rapid detection of problems and helps promote the stimulation of children in the family setting from a young age. In recent years experts have emphasized that this approach has significant economic impacts: *“In contrast to the documentation of significant long-term effects from model preschool interventions, later remediation efforts have been shown to be considerably less effective. School-age remedial programs for children and youth with cognitive limitations, for example, generally have had a poor record of success. Similarly, public job training programs, adult literacy services, prisoner rehabilitation programs, and education programs for disadvantaged adults have yielded low economic returns . . . The nature of these interventions thus has more to do with public policy considerations than with the weight of available scientific evidence of their results.”*¹

The social pediatrics approach faces enormous challenges with respect to infant and child health in Latin America and the Caribbean, but the benefits and impact that this approach can achieve in improving child health conditions make it imperative to strive for full utilization.

The population of Latin America and the Caribbean is well above 500 million. It is estimated that 27% of the Region's population, more than 125 million people, does not have access to regular health care. Moreover, 46% of the Region's population does not have health insurance, which means that more than 230 million people depend on public health services for care. A similar situation also occurs in the United States, where an estimated 44 million people do not have health insurance. In Latin America and the Caribbean, lack of access to the health services together with other factors means that an estimated 685,000 children or more do not receive the complete vaccination series indicated for their age. Finally, around 17% of all births that occur in this subregion of the continent are attended by personnel who are insufficiently trained for this task.

These conditions in Latin America and the Caribbean reflect the unequal distribution of health benefits throughout the world. The 84% of the world's population that lives in the less developed countries consumes less than 11% of global health expenditures but suffers 93% of the burden of disease that affects the world's population annually.

¹ Knudsen EI, Heckman JJ, Cameron JL, Shonkoff JP (2006). *Proceedings of the National Academy of Sciences*.

This situation can only be reversed by renewing our commitment to the basic pillars of Health for All by the Year 2000, the goal adopted by the countries in the Declaration of Alma-Ata in 1978. This declaration set forth the concept of health as a fundamental human right. It implied a commitment to defend this right by promoting broad access to information and knowledge so that the entire world population can benefit from the advances achieved in understanding the causes and determinants of disease and identifying measures that are effective for disease prevention and control and for the promotion of health and development.

Social pediatrics, when applied to practice, can contribute to fulfilling this commitment to health for all by ensuring a healthier beginning for all children. Social pediatrics provides a comprehensive approach that permits closer integration of the pediatrician into family and community life. This allows pediatricians to bring health knowledge to people and, at the same time, to update and enrich the existing body of knowledge by incorporating the contributions of families and communities. It also promotes broader participation of patients and their families in health care, in the systematic implementation of prevention measures, in health promotion, and in the continuous stimulation of children in order to improve growth and development during infancy and childhood.

Social pediatrics is an innovative approach to the health-disease process, rooted in primary care. It is inherently linked to economic and social processes, seeking to guarantee the right to health for everyone. The physician not only provides guidance but also plays a direct role in this process.

“We wholeheartedly believe in the importance of Social Pediatrics, although we observe that in recent years there has been a shift toward technology-centered and organic approaches and toward an emphasis on specialized care and treatment at the tertiary level. Health promotion, prevention, care of vulnerable populations, and advocacy for the child’s right to health should be the focus of care provided by every pediatrician.” – Dr. Jean Turgeon, Montreal, 2004.

8

Why has mortality decreased in the Pediatric Intensive Care Unit?

Dr. Fernando Stein

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In Intensive Care Units, the highest concentration of available resources and complex technology is brought to bear on serious health problems in an attempt to forestall their imminent fatal evolution, mitigate their effects and possible consequences, and, ultimately, resolve them successfully. Intensive Care Units provide an urgent response to extremely severe health situations, the great majority of which give rise to successive complications that must be dealt with in turn. As a result, these cases tend to present high levels of mortality.

However, over the last 37 years the Intensive Care Unit of the Texas Children's Hospital has registered a reduction in mortality. It is worth asking, therefore: What accounts for the marked decline in mortality in Pediatric Intensive Care Units?

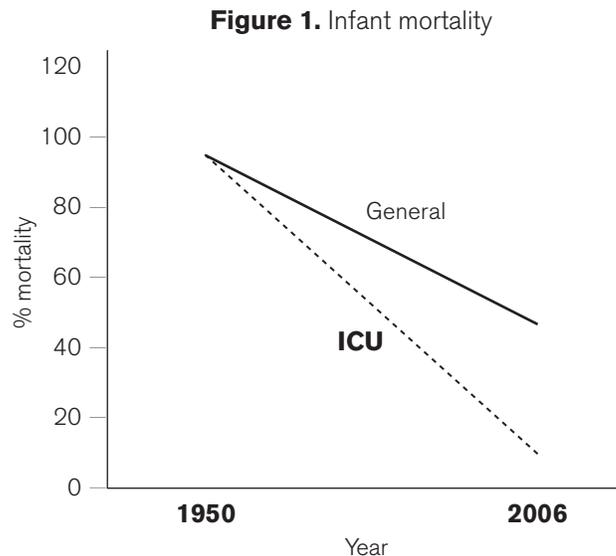
The origin of Intensive Care Units dates to the 1960s, when they mainly cared for adults suffering from cardiac attacks who died from arrhythmia or from cardiogenic shock. The units created to deal with these cases utilized a high concentration of therapeutic resources and qualified personnel to provide urgent care and continuous monitoring of patients. This same approach was applied to improve the care of children who died of respiratory failure, in particular by providing the earliest possible identification of warning signs that could indicate an imminent fatal outcome. Thus, the Pediatric Intensive Care Units sought to ensure that children did not go into cardiac arrest outside these units and that unexpected arrests did not occur after admission to the units. Toward this end, all patients with physiological instability or at risk of it were subject to intensive monitoring. The units cared for patients following cardiac catheterization or general or cardiac surgeries, and for other critically ill children.

From a level of 35% in 1970, mortality in the Pediatric Intensive Care Units was gradually reduced to 31% in 1976, representing an annual decline of 1.9%. The rate of reduction subsequently accelerated. Mortality fell to 4% in 2000, an annual decline of 3.6%, and to 2.4% in 2006, an annual decline of 6.7%.



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In Intensive Care Units, the highest concentration of available resources and complex technology is brought to bear on serious health problems in an attempt to forestall their imminent fatal evolution, mitigate their effects and possible consequences, and, ultimately, resolve them successfully.



The decline in registered child mortality in Pediatric Intensive Care Units in the period 1950–2006 was even greater than the decline in general child mortality (Figure 1).

Some of the reasons for this significant impact on mortality in the Pediatric Intensive Care Units include the reduction of mortality from sepsis, which is one of the main causes of infant mortality in the world^{2,3}, as well as the reduction that these units have achieved in deaths from trauma, which is the principal cause of child mortality in the Western world⁴.

Recent advances contributed to reducing mortality in the Pediatric Intensive Care Units. These include more effective management of hypothermia, in which good post-resuscitation results were documented in 50% of children with moderate hypothermia, and the introduction of a helium-oxygen mixture, which showed benefits in randomized studies. Other benefits came from fluid management strategies, which improved survival; the use of oxygen saturation in the superior vena cava as a vital sign that, when maintained within certain parameters, showed a reduction in mortality; the use of surfactant, which improved the oxygenation index in a study using a placebo control, obtaining a remarkable reduction in mortality; and glucose control and pain management, which also showed an improvement in mortality.

² WHO. Report on Child Mortality, 2007.

³ *Crit Care Med* 2002; 30; 1365–1378.

⁴ WHO. Report on Violence and Accidental Death, in press, 2007.

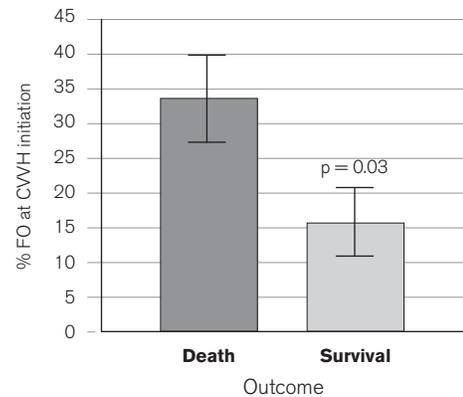
Interventions implemented very recently include *early goal-directed therapy* for the management of severe sepsis and septic shock, which has also had significant results in reducing mortality in the Intensive Care Units.

Early goal-directed therapy includes the use of supplemental oxygen or endotracheal intubation, rapid and effective access to intravenous therapy, circulatory support, the normalization of physiological and biochemical parameters, and the strict control of fluids and initiation of renal replacement therapy when necessary. The last measure is of key importance, given that fluid overload can be lethal: a lesser degree of fluid overload at the initiation of continuous veno-venous hemofiltration was associated with improved outcomes, even when adjusted for the severity of illness (Figure 2).

Figure 2. La sobrecarga de líquidos es mortal

Renal Replacement Therapy in the PICU Pediatric Literature

- > Lesser % FO at CVVH (D) initiation was associated with improved outcome (p=0.03)
- > Lesser % FO at CVVH (D) initiation was also associated with improved outcome when sample was adjusted for severity of illness (p=0.03; multiple regression analysis)

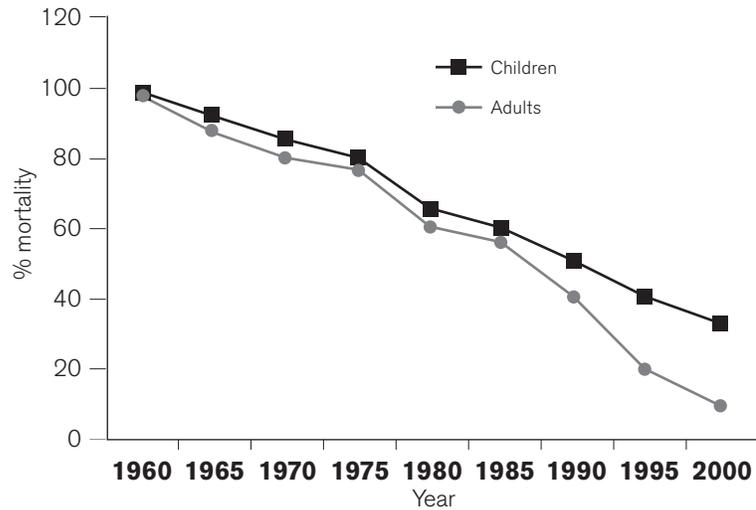


Source: Goldstein SL et al: *Pediatrics* 2001, June; 107(6):1309-12.

The positive results of *early goal-directed therapy* were demonstrated in a study carried out with 263 patients, of whom 130 were randomly assigned to early goal-directed therapy and 133 to standard therapy. A statistically significant difference in mortality was observed (p=0.009), with mortality of 30.5% in the treatment group and 46.5% in the control group. Mean APACHE II scores were lower, indicating less severe organ dysfunction, in the patients that received *early goal-directed therapy* than in the control group.

Although these benefits were seen in both adults and children, in children the impact on mortality was greater (Figure 3).

Figure 3. Decrease in Mortality from Septic Shock



Adapted from Carcillo and Fields *Crit Care Med*, Vol 30, No. 6, 2002

The positive results that were obtained with the introduction of new technologies and approaches to the management of patients in Intensive Care Units contrast with certain other interventions that, in randomized studies, did not show positive effects in terms of a reduction in mortality (Figure 4).

Figure 4. Somethings did not make a difference

Type of trial	Controlled Trials			
	# of trials	Total # patients	Mortality	
			Placebo	Therapy
Antiendotoxin	4	2010	35%	35%
Antibody to interleukin-1-receptor	3	1898	35%	31%
Anatibradykinin	2	755	36%	39%
AntiPAF	2	870	50%	45%
AntiTNF	8	4132	41%	40%
Soluble TN receptor	2	688	38%	40%
NSAIDs	3	514	40%	37%
Steroids	9	1267	35%	39%
All studies	33	12034	38%	38%

PAF= platelet activity factor; TNF=tumor necrosis factor; AINES= non-steroidal and anti-inflammatory drugs

Adapted from Zeni and colleagues.

There are still numerous areas where further improvements could be made, including the implementation of protocols for mechanical ventilation, analgesia, and sedation; the prevention and surveillance of infection; weaning; and the use of catheters and planning for their removal.

Thus, the response to the initial question about reasons for the decline in mortality in Pediatric Intensive Care Units should touch on advances in multiple areas, but it should be recognized that the single most important contribution to this mortality decline relates to the quality of care provided in these units. Improvements in care include the incorporation of advances in *goal-directed early therapy*, coordination and participation of the health care team, and the care and treatment provided to patients prior to their admission to the Pediatric Intensive Care Unit.

The organization of medical services so that they meet standards of care makes a critical contribution to the improved operation and outcomes of the Pediatric Intensive Care Units. A study of a group of units in various hospitals showed statistically significant differences between them with respect to key aspects of the organization of care (training of the professional staff, organization of prescriptions, and hours per day that professional staff were present in the unit), and these differences were associated with differential ratings of the quality of care⁵. It has also been shown that the leadership and coordination of the medical team in the units has a positive influence on the outcomes of care, measured in relation to the fulfillment of specific treatment goals for each patient^{6,7,8}.

Thus, improved organization of care is making an important contribution to more timely diagnosis and treatment and can be considered one of the main reasons for the continuous decline in mortality in the Pediatric Intensive Care Units. Continuing to reduce this mortality is the challenge that now confronts us, pointing to the need to explore and implement new approaches that contribute to further improvements in care.

In this regard, the provision of better prehospital care can make a great difference to the frequency with which children must be referred to specialized centers and, in cases requiring referral to such units, can decrease the severity of the patient's condition on arrival. Improvements in the processes of care and the distribution of patients help ensure that each child receives the resources that he or she requires, depending on the severity of the case. This will help reduce unnecessary use of diagnostic tests and treatments while at the same time ensuring that every child who requires high-complexity procedures receives them on a timely basis.

Within this framework, application of the Integrated Management of Childhood Illness (IMCI) strategy offers a great opportunity to contribute to the continuous reduction of mortality during the first years of life. It does so by affecting the organization of services, by improving the care of children, and by promoting early detection of the signs of severe illness so that treatment can be rapidly initiated.

⁵ *Critical Care Medicine*. 35(10):2256-E11, October 2007.

⁶ *Pediatric Critical Care Medicine*. 8(6):540-545, November 2007.

⁷ *Pediatric Critical Care Medicine*. 6(6):665-670, November 2005.

⁸ *Critical Care Medicine*. 36(1):36-44, January 2008.

The IMCI strategy includes a basic set of warning signs which, when applied systematically at all levels of the health services and in the home and community, help improve the timely identification of young children who require hospital treatment. The use of these simple signs—including tachypnea (defined as a respiratory rate above 50 breaths per minute in children from 2 to 11 months and above 40 per minute in children from 1 to 4 years), the use of accessory muscles for breathing, and a temperature above 39° C—has made it possible to systematize the criteria for urgent care in a hospital. In this way IMCI avoids a delay in diagnosis, during which time a child's condition can worsen, and helps ensure that children arrive at the hospital in better condition, having already received key treatment measures for their disease.

The potential for these simple measures to produce great benefits for child health is of particular interest given our growing awareness that, as Peter Orszag and Philip Ellis have noted, *relatively little rigorous evidence is available to indicate whether the benefits of more expensive therapies warrant their additional costs*. This is consistent with the groundbreaking affirmation in the Lancet series on neonatal survival that *a major barrier to action on neonatal health has been the erroneous perception that only expensive, high-level technology and facility-based care can reduce mortality*.

In order to continue to reduce mortality, the next steps should be aimed at strengthening the application of integrated strategies at all levels. In the family, the community, and all outpatient health services, IMCI can contribute to the rapid identification of those children who are critically ill and require immediate care in a hospital, distinguishing them from the great majority of children whose illness can be managed on an outpatient basis with basic care and treatment at the primary level.

In addition, because clinical status can deteriorate rapidly in severely ill infants, it is essential to strengthen the capacity of all health professionals to provide critical resuscitation care, as outlined in the *Pediatric Advanced Life Support Course*. This will allow all children who present symptoms of critical illness to be treated appropriately, leading to better outcomes.

The formation and deployment of Rapid Response Teams that reduce the time that elapses before children with serious symptoms receive health care can also help improve survival and obtain better outcomes in children who are hospitalized in Pediatric Intensive Care Units.

Another intervention that can contribute to continuing reduction in infant mortality in general and in the Pediatric Intensive Care Units in particular is medical direction of the teams that transport critically ill patients. Because the clinical picture in these patients can rapidly become severe, it is essential that the transport team be led by a highly trained physician who provides care during the transfer. The physician attempts, in essence, to bring an Intensive Care Unit to the patient, providing high-level care as soon as possible and as near as possible to the patient's location when he or she became ill.

The future of Pediatric Intensive Care Units depends in part on the development of chemical markers that can serve as early warning signs, enabling practitioners to rapidly identify children who are likely to develop serious clinical pictures, and plan their treatment. Equally important are processes to improve the quality of care, operation, and organization of the Pediatric Intensive Care Units. An example is the screen-

ing of patients to identify the severity of their illness and the need for intensive care, since 40% of hospital admissions, in general, do not require services in Pediatric Intensive Care Units.

It is likewise essential to ensure that the personnel of these units continue to upgrade their academic level and professional training through continuous in-service education programs. This will help them acquire the knowledge and skills to provide optimal care to critically ill children.

It is important to improve the placement process, so that patients are placed in accordance with their needs for diagnostic and treatment resources. This will help optimize the response, tailoring it to the characteristics of the disease and the severity of each case and thus making more efficient use of available resources.

Within this context, the future of Pediatric Intensive Care Units depends on three key developments, as outlined by Crafer:

- Development and implementation of a system that permits the early identification of changes in a child's health through physiological signs and pathobiological indicators.
- Implementation of a system for individualized care of each child based on a continuum of personnel and technology, so that changes in the personnel who take care of the child do not make a difference.
- The formation of multidisciplinary teams in which the physician increasingly plays more of a coordination role than an operational role.

Finally, the application of management and organizational sciences to health systems and services will become increasingly influential in the next few years, just as this approach has improved the efficiency of organizations in other fields. Further research is needed on how best to use management and organizational sciences to improve the efficiency of health systems and services.

9 The importance of incorporating evidence-based interventions in the content of IMCI



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The continuous evolution of human knowledge means that much of what we consider to be true at any given point in time will later be shown to be erroneous or incomplete. The process of searching for explanations of phenomena has driven the growth of knowledge throughout the history of humankind. It has allowed us not only to increase our understanding of how things work but also to take increasingly effective actions to improve the living conditions of the world's populations.

Over the last century, and especially in recent decades, the expansion of research has generated an increasingly rapid flow of new knowledge. Too often, however, this new knowledge has not reached all those who can benefit from it by changing behaviors or procedures shown to be obsolete. The speed at which new knowledge about health and disease is being produced is much greater than the speed at which this knowledge is reaching those who can apply it to benefit people. The result is greater human suffering and a greater number of deaths. Many of the diseases and deaths in the world today are associated with the failure to apply already existing knowledge or with the application of knowledge that has been proven obsolete.

With respect to neonatal health, evaluations of maternal-neonatal care have been carried out by the Pan American Health Organization/World Health Organization (PAHO/WHO) between 2006 and 2008. They have shown that, although in most of the countries neonatal mortality accounts for about 70% of mortality in children under 1 year of age and for nearly 50% in children under 5, many of the cost-effective measures that would contribute to reducing this mortality are not being applied.

The findings also showed that, in many countries, health workers and the faculty of medical schools, both public and private, are unaware of these measures or have only an incomplete knowledge of them. Thus it is not surprising to find that these interventions to improve neonatal health are not being applied in the health services, public or private; nor are they reflected in the recommended standards and protocols contained in guidelines used by the health services.



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Over the last century, and especially in recent decades, the expansion of research has generated an increasingly rapid flow of new knowledge. Too often, however, this new knowledge has not reached all those who can benefit from it by changing behaviors or procedures shown to be obsolete.

In light of all this, the incorporation into Neonatal IMCI of new evidence in the field of peri-neonatal health is of great importance. It has enabled these interventions to be applied in the continuum of care with respect to all three of its dimensions: the life cycle, the place of care, and the type of intervention.

At present, 85% of neonatal mortality in the Region of the Americas occurs in Latin America and the Caribbean. Although preterm delivery is the leading cause of neonatal mortality in both subregions, it is worth noting that severe infection still ranks high among the causes of neonatal deaths in Latin America and the Caribbean, with a share three times higher than in Canada and the United States (Figure 1).

Figure 1. Neonatal mortality by cause in Latin America and the Caribbean and in Canada and the United States

Cause of neonatal death	Latin America and the Caribbean N = 166,000 (85%)	Canada and the United States N = 29,000 (15%)
Neonatal tetanus	2,000 (1%)	0 (0%)
Severe infection	32,000 (19%)	2,000 (6%)
Diarrheal disease	1,000 (1%)	0 (0%)
Birth asphyxia	33,000 (20%)	4,000 (14%)
Preterm birth	65,000 (39%)	13,000 (45%)
Congenital malformations	22,000 (13%)	8,000 (29%)
Other	11,000 (7%)	2,000 (7%)

Source: *Nacer Latinoamericano*. 2005. PAHO/WHO.

Achieving a reduction in neonatal mortality requires actions to improve health care for women before and during pregnancy, in order to ensure adequate intrauterine growth of the fetus during gestation, as well as provision of proper care during labor and delivery and appropriate monitoring of the newborn and the puerpera.

The risk of neonatal death is much greater in the infant of a mother who develops preeclampsia or eclampsia, and is associated mainly with the need for mechanical respiratory assistance and with acute renal failure, respiratory distress syndrome, and lung hemorrhage.

Calcium supplementation has proven useful in reducing the risk of preeclampsia and helping to prevent preterm labor. A systematic review of 12 studies of good quality⁹ found that the risk of hypertension was reduced with administration of calcium supplements rather than a placebo (11 trials, 14,946 women: relative risk [RR] 0.70; 95% confidence interval [CI]: 0.57 to 0.86). Calcium supplementation was also associated with a reduction in the risk of preeclampsia (12 trials, 15,206 women: RR 0.48; 95% CI: 0.33 to 0.69). The

⁹ G. J. Hofmeyr, A. N. Atallah, and L. Duley. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. *Cochrane Database of Systematic Reviews* 2006, Issue 3. Art. No.: CD001059. DOI: 10.1002/14651858.CD001059.pub2.

effect was greater for high-risk women (5 trials, 587 women: RR 0.22; 95% CI: 0.12 to 0.42) and for those with low baseline calcium intake (7 trials, 10,154 women: RR 0.36; 95% CI: 0.18 to 0.70).

Thus, calcium supplementation appears to almost halve the risk of pre-eclampsia and to reduce the rare occurrence of the composite outcome “death or serious morbidity,” without other clear benefits or harms.

Figure 2. Recommendations for the administration of calcium during pregnancy for the prevention of eclampsia and preeclampsia

Dose of elemental calcium: Pregnancy <20 weeks gestational age to birth

Low risk: 1 g/day orally, + low calcium intake: 1.5–2 g/day

High/medium risk: 1.5 g/day + low calcium intake: 2 g/day

Source: Cochrane 2008. *BMJ Clinical Evidence* 2008. Clinical Practice Guideline no. 206. JOGC March 2008.

The use of antiplatelet agents also appears beneficial for the treatment of preeclampsia. In a systematic review of randomized trials that compared antiplatelet agents with placebo or with no antiplatelet agent,¹⁰ it was found that antiplatelet agents, largely low-dose aspirin, have moderate benefits when used for prevention of preeclampsia and its consequences.

Antiplatelet agents were associated with a 17% reduction in the risk of preeclampsia, an 8% reduction in the relative risk of preterm birth, a 14% reduction in fetal or neonatal deaths, and a 10% reduction in small-for-gestational-age newborns.

The administration of antiplatelet agents to pregnant women at medium or high risk of preeclampsia could thus contribute to an additional reduction in the incidence of the disease and in the maternal and perinatal health problems associated with it (Figure 3).

¹⁰ L. Duley, D. J. Henderson-Smart, S. Meher, and J. F. King. Antiplatelet agents for preventing pre-eclampsia and its complications. *Cochrane Database of Systematic Reviews* 2007, Issue 2. Art. No.: CD004659. DOI: 10.1002/14651858.CD004659.pub2.

Figure 3. Recommendations for the administration of aspirin during pregnancy for the prevention of preeclampsia

Dose in pregnancies at risk of preeclampsia:

- > **Moderate risk:** 75–100 mg/day orally
- > **High risk:** 100–150 mg/day orally at bedtime

from 12–13 weeks gestation until birth

Source: 59/123 RCT in 37,560 women at risk of pre-eclampsia. Cochrane 2008. *Clinical Evidence* 2008. SOGC Clinical Guideline no. 206. *JOGC* (the official voice of reproductive health care in Canada) March 2008. *Lancet* 07.

Another risk factor for preterm birth is associated with low body mass index (BMI) of women before pregnancy¹¹ and with low weight gain during pregnancy, especially in women who were underweight before they became pregnant¹². Better nutritional status of women in adolescence and young adulthood that results in an adequate Body Mass Index, as well as appropriate control and monitoring during pregnancy, will help reduce the number of births to women who are underweight or have inadequate weight gain during pregnancy.

Another neonatal health problem that is still not resolved, despite the availability of prevention interventions, is that of neural tube defects and other congenital malformations that can be prevented with a timely and sufficient administration of folic acid to women during pregnancy. It is estimated that this intervention could prevent approximately 250,000 births per year with neural tube defects.

Although this recommendation is available and many countries have incorporated it into the care provided by the health services, the intervention has by no means reached all the people of the continent. As with other technologies, access is lower among the most vulnerable groups. Even those Latin American countries that have a good record in providing maternal and child health care (Chile and Uruguay) have recently published data showing that the distribution of folic acid reaches only about 2.5% of women.

In order to reduce the rate of neural tube defects and other congenital malformations by at least half in Latin America and the Caribbean, women should receive folic acid from three months before the beginning of pregnancy through three months after the birth, along with multivitamins. Consumption of vitamin-fortified food is not sufficient. Twenty-four countries have carried out measurements and found that it is not enough to enrich the food supply; rather, folic acid and multivitamins must be given before pregnancy begins in order to reduce the rate of neural tube defects and other congenital malformations.

¹¹ Hyagriv N. Simhan and Lisa M. Bodnar. Prepregnancy Body Mass Index, Vaginal Inflammation, and the Racial Disparity in Preterm Birth. *American Journal of Epidemiology* 163, no. 5 (2006): 459–466.

¹² L. A. Schieve, et al. Prepregnancy Body Mass Index and Pregnancy Weight Gain: Associations with Preterm Delivery. *Obstetrics & Gynecology* 96, no. 2 (August 2000): 194–200.

The Neonatal IMCI strategy has created an annex for use in prepregnancy consultations, with interventions to promote behaviors that improve health during pregnancy, including the habit of taking folic acid.

Figure 4. Recommendations for prevention of neural tube defects (NTD) and other congenital malformations (CM)

Prevention of the occurrence of NTD and other CM in low-risk women (II-2-A)

- > **All pregnant women should be advised to consume a diet rich in folic acid:**
 - **folic acid 0.4–1.0 mg + multivitamins, orally, per day, from 3 months before conception through 3 months after the birth (or for the duration of maternal lactation)**

[RRR 46% NTD and CM; RR 0.54 (0.39, 0.76) p = 0.0003]

Prevention of the Occurrence and Recurrence of NTD and other CM in HIGH-RISK women (Evidence II-A)

- > **Dose: FOLIC ACID + MULTIVITAMINS**
 - **FA 4–5 mg/day + multivitamins, from 3 months before conception through the 3rd month of pregnancy**
 - **FA 0.4–1 mg/day + multivitamins, from the 3rd month of pregnancy through 3 months after the birth (or for the duration of maternal lactation), orally, per day**

Cochrane 2008. *BMJ Clinical Evidence* 2008. *JOGC, Guidelines* March 2008.

The early detection and treatment of infections in pregnant women is another intervention with sufficient evidence of a positive impact in the reduction of preterm birth and low birthweight. A review of randomized controlled trials¹³ demonstrated that the incidences of preterm birth for low birthweight preterm infants and very low birthweight infants were significantly lower in the intervention group that received antibiotic treatment than in the control group.

The use of antibiotics for the treatment of premature membrane rupture also showed results in the reduction of neonatal infection and perinatal mortality (Figure 5).

¹³ U. S. Sangkomkarnhang, P. Lumbiganon, W. Prasertcharoensook, and M. Laopaiboon. Antenatal lower genital tract infection screening and treatment programs for preventing preterm delivery. *Cochrane Database of Systematic Reviews* 2008, Issue 2. Art. No.: CD006178. DOI: 10.1002/14651858.CD006178.pub2.

Figure 5. Antibiotics in premature membrane rupture before 37 weeks of gestation
Antibiotics (Erythromycin, Co-amoxiclav, Benzylpenicillin, Ampicillin, Piperacillin, Clindamycin)
versus placebo. Reduce with DES:

	RRR%	RR	95% IC
Neonatal infection (hemocult)	32	0,68	(0,53, 0,87)
Requires oxygen	12	0,88	(0,81, 0,96)
Use of surfactant	17	10,83	(0,72, 0,96)
Abnormal cerebral ultrasound	18	0,82	(0,68, 0,98)
Perinatal mortality 18 RCT, n = 6,951	13	0,87	(0,72, 1,05)
Amoxi-Clavulanate NNE		4,6	(1,98, 10,7)

Martínez Guittén F. "Medicina Perinatal Basada en Evidencia" 2005.

19 RCT, n > 6,000 women with premature membrane rupture before 37 weeks of gestation.

The use of uterine inhibitors such as nifedipine has also been found useful in delaying the onset of labor, and studies have shown positive results in reducing the number of live births that occur before week 34. This has brought about a reduction in neonatal complications, including a reduction in cases of respiratory distress syndrome.

Yet another intervention for which there is solid evidence is the use of prenatal corticoids in order to accelerate pulmonary maturation, which has resulted in a reduction in respiratory distress syndrome and neonatal mortality. A literature review was conducted of studies in which randomized controlled trials compared the administration of prenatal corticosteroids with placebo, designed to evaluate effects on fetal and neonatal morbidity and mortality, on maternal mortality and morbidity, and on the child in later life¹⁴. The studies demonstrated that treatment with prenatal corticosteroids is associated with an overall reduction in neonatal death, respiratory distress syndrome, cerebroventricular hemorrhage, necrotizing enterocolitis, the need for respiratory support, admission to neonatal intensive care units, and systemic infections in the first 48 hours of life.

Thus, this evidence supports the continued use of a single course of antenatal corticosteroids to accelerate fetal lung maturation in women at risk of preterm birth.

Despite the benefits of this intervention in reducing neonatal morbidity and mortality, it is estimated that less than 30% of the women in Latin America and the Caribbean who require this treatment receive it.

A set of additional interventions have also been shown to be effective in improving perinatal results (Figures 6a and 6b). They include upgrading the knowledge and practices of the personnel responsible for providing care to women, both before and during pregnancy, and to newborns.

¹⁴ D. Roberts and S. R. Dalziel. Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD004454. DOI: 10.1002/14651858.CD004454.pub2.

Figure 6a. Evidence-based interventions for reduction of neonatal-perinatal mortality

Intervention	Target population	Expected impact	%	Implementation strategies	Tools available for implementation
Training of traditional birth attendants in basic care of newborns and referral to the health system	In regions where traditional birth attendants are used frequently	* DES decreases:		Training or theory-practicum in neonatal community IMCI	Community IMCI training tool <i>Lancet</i> , 13–19 September 2008, vol. 372, pages 972–989
		– Fetal deaths (OR 0.69, 0.57–0.83)	31		
		– Perinatal deaths (OR 0.70, 0.59–0.83)	30		
		– Neonatal mortality (0.71, 0.61–0.82)	29		
		* DES increases:			
		– Maternal referrals (1.50, 1.18–1.90, p <0.001)	50		
		* DES decreases:			
		– Postpartum hemorrhage (OR 0.61, 0.47–0.79)	39		

Figure 6b. Evidence-based interventions for reduction of neonatal-perinatal mortality

Continuous care by: – trained traditional birth attendants – birth attendants, – physicians	Universal	* DES decreases:		Training and – implementation throughout the network of care, from the community through the hospital level	Community neonatal IMCI <i>Lancet</i> 08, Cochrane 2000
		– Antenatal hospitalization for complications (0.79, 0.64–0.96)	21		
		– One-minute Apgar < 7 (0.53, 0.44–0.64)	47		
Training in a strategy for basic neonatal resuscitation in: – health facilities – community		* In health facilities, decreases:			Clinical and community neonatal IMCI <i>Lancet</i> , 13–19 September 2008, vol. 372, pages 972–989
		– Incidence of mild asphyxia (from 14% to 6%, p <0.0001)	60		
		– Mortality from severe asphyxia (from 39% to 20%)	47		
		– Case fatality rate from asphyxia (from 11% to 4%, p <0.02)	65		
		– Resuscitation at home by community health workers reduced mortality by 67%, specifically from asphyxia. RS better survival resuscitating with air versus oxygen (RR 0.71, 0.54–0.94)			

Finally, one of the simplest and most economical interventions, which has shown abundant evidence of benefits for maternal and child health, is breastfeeding. However, the proportion of all children in the Region of the Americas who are breastfed is still low. Compared with initiation of breastfeeding within one hour of birth, initiation of breastfeeding after the third day is associated with a risk of death more than four times higher (Figure 7).

Figure 7. Risks of neonatal mortality according to timing of initiation of breastfeeding

Initiation of breastfeeding	No. (%) of infants	No. of deaths (% risk) ^a	aOR 1 (95% CI) ^b
Within 1 hour	4763 (43)	34 (0.7)	1
From 1 hour to end of day 1	3105 (28)	36 (1.2)	1.45 (0.90 to 2.35)
Day 2	2,138 (20)	48 (2.3)	3.01 (1.70 to 5.38)
Day 3	797 (7.3)	21 (2.6)	3.01 (1.70 to 5.38)
After day 3	144 (1.3)	6 (4.2)	4.42 (1.76 to 11.09)
Total	10,947 (100)	145 (1.3)	

LRT indicates likelihood ratio test.

a. % risk = no. of deaths/no. of infants in exposure category.

b. Adjusted for gender, birth size, gestational age, presence of a congenital anomaly, health on day of birth, mother's health, age of mother, parity, educational level of mother, mother having cash income, place of birth, and birth attendant.

c. Adjusted for all factors mentioned previously plus established breastfeeding pattern.

d. The combined aOR for initiation of breastfeeding after 1 day

n = 10,947/14,403 live births and 145 neonatal deaths between 2 and 28 days.

Pediatrics 117, no. 3 (March 2006).

The risk of death also increases in relation to the type of breastfeeding that newborns receive, with an increase in the risk when breastfeeding is predominant rather than exclusive. The risk increases by more than four times when breastfeeding is partial.

Evidence from these various studies makes clear that there is a great wealth of knowledge about how to improve the quality of services, but actions are needed to ensure that these improved services reach the people who need them. Toward this end, steps should be taken not only to guarantee distribution of the necessary inputs but also to increase the knowledge of all health workers so that they incorporate these evidence-based practices into the routine care they provide.

The challenge ahead, therefore, is to find ways to reach all the Region's populations so that they have access to the growing body of scientific and technical resources that are presently reaching only a few.

A crucial point, according to the latest reports from PAHO, is that many resources are not being used. Thus the most immediate priority is not to seek new resources but to disseminate knowledge about the tools that are already available, as these, if widely applied, would be sufficient to achieve and sustain the desired results. The great challenge, therefore, is to ensure that these tools and this knowledge reaches the populations that need the interventions. Toward this end, the most appropriate strategy is Integrated Management of Childhood Illness (IMCI), applied by the different actors who participate in the care and treatment of children at all levels of the health services and through all types of interventions.



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Nurses intervene actively and continuously in the care of children, and their close relationship with the family gives them a key role in the transfer of knowledge and practices that improve the care provided to children in the home and community.

10 Integration of the nursing schools of Latin America and the Caribbean into the IMCI process: A new perspective



Dr. Rolando Cerezo

INCAP/PAHO

Nurses have a key role to play in the prevention and treatment of diseases in children, in the promotion of growth and development in infancy and childhood, and in the promotion of healthy feeding and appropriate care of children in the family and the community. It is therefore essential to recognize the importance of nurses as members of the health team in order to achieve integrated health care of women, mothers, newborns, and children.

Nurses intervene actively and continuously in the care of children, and their close relationship with the family gives them a key role in the transfer of knowledge and practices that improve the care provided to children in the home and community. Moreover, nursing personnel have important functions at all levels of the health services, including at the hospital level in pediatric and neonatal intensive care units, which care for the most seriously ill children and newborns.

As part of the health team, nurses provide guidance regarding specific functions in the diagnosis, treatment, and monitoring of diseases, as well as activities of prevention and health promotion. This role has required their increasingly active participation in the design and preparation of guides, standards, and plans for children's health care, with a view to disseminating quality standards that will contribute to bringing best practices in health care to all children through their application by all health personnel.

In this context, the incorporation of nursing schools and colleges in the process of design, adaptation, and implementation of the Integrated Management of Childhood Illness (IMCI) strategy can strengthen the efforts being made to improve child health and achieve the Millennium Development Goals in 2015.

The VIII Iberian American Conference on Nursing Education, held on 29 November 2005 in Concepción, Chile, analyzed the situation of children in Latin America and the Caribbean and the ways in which IMCI could serve as a strategy for integration of care. The conference discussed the possibility of promoting the inclusion of IMCI in nursing education. Toward this end, it was proposed that the process of adapting available training materials for nursing personnel be accelerated, which would allow IMCI to be included in the training for nursing careers.

This proposal comes against the backdrop of the diverse situation of nursing schools and colleges in Latin America and the Caribbean, characterized by:

- > A vision of training focused on health promotion and disease prevention, reflecting one of the roles that nurses fulfill in the majority of outpatient health services and even in hospitals.
- > An emphasis, within training, on primary care, the level at which most nursing personnel work in the majority of Latin America and Caribbean countries.
- > The lack of incorporation, in some nursing schools and colleges, of a strong component of training in neonatal care.
- > A lack of specificity, in some cases, in adapting the content of training to the field of nursing, often because medical approaches have not been adapted to reflect specific aspects of the nursing role.

The proposal to adapt the IMCI strategy so that it can be incorporated in nursing education was based on the recognition that nurses and physicians require different competencies and use different processes in providing health care to children. It is therefore essential to adapt the training materials to relate to the specific processes used by nurses in order to strengthen the role of nursing personnel in the care and treatment of children, in both primary care and hospital settings.

The proposed adaptation of the IMCI training for nursing personnel has three main objectives:

- > Ensure that all students graduate with the knowledge, skills, and attitudes necessary to provide integrated care that spans the levels of health promotion (intersectoral work), prevention, and treatment. They should acquire capacities and attitudes in the areas of management, communication, and research that enable them to provide leadership in implementation of the IMCI strategy.
- > Disseminate the IMCI strategy in nursing schools, in the ministries of health, and in trade unions and professional associations as an efficient means of achieving the Millennium Development Goals.
- > Use new technologies for teaching IMCI that will reach a greater number of health professionals.

Toward this end, a series of regional workshops was held to address the adaptation of IMCI training to the field of nursing. The series began with a workshop in Lima, Peru, in September 2006, which formulated recommendations for proposed changes to the draft of the IMCI clinical manual for nursing. This workshop was repeated later in the year in Managua, Nicaragua, with educators from nursing schools and colleges. They discussed progress and challenges of the strategy within the framework of the Millennium Development Goals, shared teaching experiences, and developed an action plan for introduction of the strategy.

At the beginning of 2007, a clinical workshop for educators from nursing schools and colleges was held in Managua, Nicaragua. Its purpose was to examine results of the study on the teaching of child health in the nursing schools of Latin America, review the IMCI methodology for comprehensive care of children from birth to age 5 years, and propose changes to the IMCI clinical manual for nursing. With these same objectives, two additional workshops were held, the first in Guatemala and the second in Asunción, Paraguay, enriching

the discussion with contributions from representatives of various nursing schools and colleges in different countries of the Region of the Americas.

In mid-2008, 20 nursing school educators met in Quito, Ecuador, to review the material adapted as a result of the previous meetings held in the Region. The opinions of this group of educators will be incorporated when the material is prepared for publication.

At the end of 2008 an additional meeting was held in Guatemala to begin the process of analyzing the curriculum changes that would be needed in schools that train nurses and nursing auxiliaries in order to offer a master's degree in maternal and neonatal health and create a training program for obstetric nurses, applying the IMCI strategy.

This process over the last few years has led to some noteworthy achievements that will help strengthen the implementation of IMCI in the Region of the Americas. It has been made possible to a great extent by active collaboration of the Latin American Association of Nursing Schools and Colleges (ALADEFE), which has affirmed the importance of introducing the content of IMCI into the curricula of its member institutions.

To date, more than 300 professional nursing educators have participated in the review and adaptation of the IMCI clinical manual for nursing. A generic version of the manual is already in press and will be available for use in upcoming training workshops. This IMCI manual for nursing was presented at the end of 2009 during the Latin American Nursing Colloquium held in Quito, Ecuador.

The steps taken up to the present reaffirm the commitment of the nursing profession to achieve better health conditions for the children of Latin America and the Caribbean. A rapid expansion of IMCI throughout the Region will help bring the strategy's benefits to all the children of the continent and help move toward achievement of the Millennium Development Goals in 2015.



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11

Conclusions and Recommendations



Integrated Management of Childhood Illness (IMCI) Sixth Meeting of the Regional Technical Advisory Group on IMCI (IMCI-TAG)

Houston, Texas, 28–29 October 2008

1. IMCI-TAG backs the Regional Strategy and Plan of Action for Neonatal Health within the Continuum of Maternal, Newborn, and Child Care¹⁵, considering all three dimensions of the continuum (the life cycle, the different levels of care, and the different types of intervention). IMCI-TAG recommends providing support for the countries in their efforts to:
 - 1.1. Prepare their own national plans for reducing perinatal, maternal, and postneonatal mortality, as well as mortality after the first year of life, focusing on the achievement of national goals and on the reduction of gaps between different geographic areas and population groups in order to increase equity.
 - 1.2. Create mechanisms for coordinating the key actors concerned with health and social development, at both the national and local levels, in order to ensure sustainable, comprehensive, and efficient plans to reduce maternal and infant morbidity and mortality.
 - 1.3. Create intersectoral groups, both governmental and nongovernmental, to follow up, monitor, and evaluate advances in implementation of the national plans.
2. Provide support from the regional level for training in the IMCI strategy, directed to personnel in academia, the health services, and the ministries of health, social development, and research, both at the regional level and in the countries, in order to ensure a critical mass of people who are actively involved in and committed to support and promotion of the strategy.

¹⁵ Document of the 48th Directing Council of PAHO.

3. Expand the body of knowledge about the strengths of the IMCI strategy in different epidemiological, health, social, and economic scenarios, including evidence on:
 - 3.1. The effectiveness of IMCI for initial evaluation (triage), classification, and timely and appropriate treatment of patients, and for improving the process of referral and counter-referral between levels of care.
 - 3.2. The potential for IMCI to integrate children's health care and link prevention, early diagnosis, and appropriate treatment of children with the health care and treatment of the mother and the family.
 - 3.3. Changes in the epidemiological situation of children in the Region of the Americas, and the effectiveness of interventions to improve health conditions, promoting a continuing dialogue between epidemiologists and health workers at the different levels of care and management.
 - 3.4. The economic impact of the application and outcomes of IMCI for the prevention, treatment, and promotion of child health at the different levels of the health structure.
4. Seek access to leaders in politics, academia, legislative bodies, communities, and the media in order to promote knowledge about the effectiveness and impact of the IMCI strategy, through the following actions:
 - 4.1. Work through PAHO/WHO to reach out to the different levels of government in the countries in order to promote IMCI to national and local policymakers, build sustained support for implementation of the strategy, and guarantee financing for its activities in national budgets.
 - 4.2. Provide technical support to opinion leaders in the countries to ensure that IMCI is recognized as one of the essential health policies that contributes to achievement of the Millennium Development Goals.
 - 4.3. Continue to promote the incorporation of IMCI as an important topic for discussion in national and international conventions in pediatrics, infectious diseases, general and family medicine, social and community medicine, nursing, and public health, and in the publications of these specialties.
 - 4.4. Strengthen the integration of IMCI into the education of students for careers in the health sciences.
 - 4.5. Promote information, education, and social communication on the IMCI strategy and its positive impact on children's health in order to build support for sustained national implementation efforts and for political decisions to guarantee all children access to the strategy's benefits.
 - 4.6. Promote, at the level of the countries, the development of more efficient initiatives to provide universal access to essential information about key practices for improving child health and about the services that IMCI offers, including the use of alternative communications media to disseminate this information to the most vulnerable groups.

Working Group 2: Identification of key aspects of the development of national plans to promote peri-neonatal health and equitable universal access to maternal, neonatal, and child health care, with special emphasis on reaching the most vulnerable population groups.

5. Facilitate and promote the formation of partnerships at the national, subnational, and local lev-

els, based on the regional partnership that exists to support achievement of the MDGs related to child health, in order to promote the active participation of all sectors in supporting implementation of IMCI, monitoring of its progress and outcomes, and evaluation of its impact.

- 5.1. Promote regional coordination with the NGOs working in the countries so that they incorporate IMCI and help improve the access of vulnerable groups to the strategy's benefits.
6. Strengthen promotion of the content and recommendations of IMCI through the press and the communications media at the regional, national, and local levels, through the following actions:
 - 6.1. Coordinate with existing information agencies at the regional and national levels to gain their participation and involvement in the dissemination of key information on the situation of child health, the international commitments adopted to improve it, and the potential for the IMCI strategy to contribute to the reduction of infant mortality and the achievement of better health and development conditions for children and families.
 - 6.2. Promote, at the regional, national, and local levels, the identification of journalists and others involved in information diffusion so that they can disseminate information on the IMCI strategy and its benefits for child health, making efforts to ensure that information reaches the most vulnerable groups.
 - 6.3. Make greater use of the Internet for the dissemination of information on child health and the IMCI strategy, promoting ties between key institutions that are working in the area of child health.

7. Carry out continuous review and updating of studies and research that document the impact of specific interventions in preventing maternal and child health problems, and promote linkages between research groups in the different countries in order to strengthen the available scientific evidence that supports the IMCI strategy and promote the design of appropriate new technologies in primary care.

Working Group 3: Propose lines of action, activities, and plans for strengthening health information systems and systems for surveillance, monitoring, and evaluation.

8. Promote analysis of data on the indicators of child health conditions and on the performance and results of the health services and health workers with respect to application of the IMCI strategy, including analysis of the association between performance indicators and indicators of impact on childhood mortality and morbidity, through the following actions:
 - 8.1. Support the countries in continuously updating their information on the situation of child health.
 - 8.2. Develop guidelines for monitoring aspects such as the health services infrastructure, health worker performance, and outcomes of care, based on the available scientific evidence that supports the recommendations of the IMCI strategy.
 - 8.3. Contribute to the continuous upgrading of the coverage and quality of registries on mortality and on morbidity and care.
 - 8.4. Disaggregate the available information to identify the most vulnerable geographic areas and population groups in order to reveal existing inequalities in the child health situation.

9. Promote the development and preparation of country profiles on child health, with the participation of the different divisions of the ministries of health that are involved in the production and management of statistical, epidemiological, and economic information.

12

ANNEXES

Annex 1. Objectives and Agenda

**Sixth meeting of the Technical Advisory Group on IMCI (IMCI-TAG)
Texas Children's Hospital, Houston, Texas**



28–29 October 2008

OBJECTIVES OF THE MEETING

1. Analyze the new political and epidemiological scenarios that affect the health of children in the Region of the Americas throughout their life cycle, considering the determinants of health status and the role of the IMCI strategy in this process.
2. Identify key actions that can help accelerate the development of national plans to promote peri-neonatal health and equitable universal access to maternal, neonatal, and child health care in the context of the continuum of care, with emphasis on reaching the most vulnerable population groups.
3. Propose lines of action, activities, and plans for strengthening health information systems and systems for surveillance, monitoring, and evaluation.
4. Analyze community interventions and propose community mobilization activities and social communication strategies to promote healthy behaviors within primary health care and in the context of the continuum of care.
5. Identify key activities at the regional level and in the countries that can create and strengthen partnerships and associations and the mobilization of resources to support sustainable implementation of the IMCI strategy within the health services, the community, and the family.

AGENDA

DAY 1: TUESDAY, 28 OCTOBER 2008

8:00 – 8:15	Transfer to Texas Children's Hospital
8:15 – 8:45	Breakfast – Sam Fomom Room, CNRC Building
8:45 – 9:05	Welcoming remarks <i>Mr. Mark Wallace, President, Chief Executive Officer, Texas Children's Hospital</i>
9:05 – 9:15	Inauguration and introduction of participants <i>Dr. Yehuda Benguigui, Newborn, Child, and Youth Health / Family and Community Health, PAHO/WHO</i> <i>Dr. Fernando Stein, Texas Children's Hospital</i>
9:15 – 9:45	Conference organization and procedures, designation of conference coordinator and rapporteur, and adoption of conference agenda
9:45 – 10:05	Presentation: "Progress in Carrying Out Recommendations Proposed by the Technical Advisory Group on IMCI (IMCI-TAG) from 2001 to 2006" <i>Dr. Yehuda Benguigui, Newborn, Child, and Youth Health / Family and Community Health, PAHO/WHO</i>
10:05 – 10:25	Presentation: "Neonatal Health within the Continuum of Maternal, Newborn, and Child Care: Regional Strategy and Plan of Action" <i>Dr. Rolando Cerezo, INCAP/PAHO</i>
10:25 – 11:00	Presentation: "Experiences with Hurricane Katrina and Actions of the Texas Children's Hospital during the Hurricane Ike Emergency" <i>Dr. Fernando Stein, Texas Children's Hospital and Dr. Joan Shook, Texas Children's Hospital</i>
11:00 – 11:15	Break
11:15 – 11:35	Presentation: "Importance of the Political Process for Adaptation of the IMCI Strategy in National Policies: The Example of Argentina" <i>Dr. Juan Carlos Bossio, Newborn, Child, and Youth Health / Family and Community Health, PAHO/WHO</i>
11:35 – 12:30	Working Group 1: Analysis of the new political and epidemiological scenarios that affect the health of children in the Region of the Americas throughout their life cycle, considering the determinants of health status and the role of the IMCI strategy in this process.
12:30 – 13:00	Plenary discussion and formulation of recommendations of Working Group 1
13:00 – 14:00	Luncheon
14:00 – 15:00	Working Group 2: Identification of key aspects of the development of national plans to promote peri-neonatal health and equitable universal access to maternal, neonatal, and child health care, with special emphasis on reaching the most vulnerable population groups.
15:00 – 15:30	Plenary discussion and formulation of recommendations of Working Group 2
15:30 – 15:45	Break
15:45 – 16:30	Working Group 3: Development of proposed lines of action, activities, and plans for strengthening health information systems and systems for surveillance, monitoring, and evaluation.
16:30 – 17:00	Plenary discussion and formulation of recommendations of Working Group 3
17: - 17:15	Return to the Hotel
18:30 – 21:00	Dinner hosted by Texas Children's Hospital

DAY 2: WEDNESDAY, 29 OCTOBER 2008

8:00 – 8:15	Transfer to Texas Children's Hospital
8:15 – 8:45	Breakfast – Sam Fomom Room, CNRC Building
8:45 – 9:00	Feedback on conference process
9:00 - 9:20	Presentation: "The Importance of Incorporating Evidence-based Interventions in the Content of IMCI" <i>Dr. Francisco Martínez, Regional Consultant on Neonatal IMCI, PAHO/WHO, Nicaragua</i>
9:20 – 9:40	Presentation: "Why Has Mortality Decreased in Pediatric Intensive Care Units?" <i>Dr. Fernando Stein, Texas Children's Hospital</i>
9:40 – 10:00	Presentation: "Integration of the Nursing Schools of Latin America and the Caribbean into the IMCI Process: A New Perspective" <i>Dr. Rolando Cerezo, INCAP/PAHO</i>
10:00 – 11:00	Working Group 4: Identification of key activities to create and strengthen partnerships and associations and the mobilization of resources to support the sustainability of IMCI.
11:00 – 11:15	Break
11:15 – 11:40	Plenary discussion and formulation of recommendations of Working Group 4
11:40 – 12:30	Working Group 5: Analysis of community interventions and proposal for community mobilization activities and communication strategies.
12:30 – 13:00	Plenary discussion and formulation of recommendations of Working Group 5
13:00 – 14:00	Luncheon
14:00 – 15:00	Formulation of conference recommendations
15:00 – 15:15	Break
15:15 – 15:45	Review and finalization of the working group recommendations
15:45 – 16:45	Reading, discussion, and adoption of the final document
16:45 – 17:00	Closure <i>Dr. Fernando Stein, Texas Children's Hospital</i> <i>Dr. Yehuda Benguigui, Newborn, Child, and Youth Health / Family and Community Health, PAHO/WHO</i>
18:30 – 21:00	Dinner hosted by Texas Children's Hospital

Annex II: Participants



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** Could not attend.*

