



## **TECHNICAL ADVISORY GROUP ON IMCI (IMCI-TAG)**

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

Report on the Seventh Meeting

Texas Children's Hospital, Houston, Texas, U.S.A.  
11 – 12 November 2009



**Pan American  
Health  
Organization**

Regional Office of the  
World Health Organization



**Texas Children's Hospital**



Family and Community Health  
Healthy Life Course Project (FCH/HL)

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**This document contains a summary of the seventh 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 seventh meeting of IMCI-TAG was held at Texas Children's Hospital, Houston, TX, USA, on 11 and 12 November 2009. The meeting was coordinated by Alberto Bissot, who is a member of IMCI-TAG.**



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# 1 PROLOGUE

## **Dr. Mirta Roses Periago**

Director, Pan American Health Organization  
Regional Office of the World Health Organization



**Dr. Mirta Roses Periago**

In 2008, the countries of the Region of the Americas showed a 50% reduction in mortality in children under 5 over 1990 figures. This significant achievement is still not enough to ensure attainment of the Millennium Development Goals proposed for 2015, which means that we must accelerate the reduction process and focus on the most vulnerable groups and newborns, who have least benefited from this decline.

The Pan American Health Organization is extremely honored that Texas Children's Hospital (TCH), through its President and Executive Director Mark A. Wallace and Physician-in-Chief Dr. Mark W. Kline, has sponsored the seventh meeting of the IMCI-TAG group. This expert group, with its wealth of experience and information from the technical secretariat, offers its best recommendations for ensuring that the IMCI strategy remains an current date resource capable of meeting the new challenges and demands of the countries of the Region.

Texas Children's Hospital, as a PAHO/WHO Collaborating Center, is a world-renowned scientific and technical institution that is part of a network of collaborating institutions recognized by WHO as among the most highly qualified in the technological world. WHO relies on this network when implementing its programs in countries, among countries, or at the regional, interregional, or global level. This has made it possible to identify areas of cooperation in which PAHO and TCH can promote their programs and activities.

Despite globalization and the spectacular scientific and technical advances in informatics of recent years, we are still faced with the challenge of reaching the majority of professionals, and through them, families and communities. Advances in distance learning and interactive online courses, as well as the growing body of documents published by IMCI pose a challenge not only because of active population growth, but because of many the limited access of many professionals to these technologies, which obliges them to pursue their education in the more costly and limited traditional manner.

All PAHO member countries have been affected by the challenges stemming from the global economic crisis. This alerts and motivates us to seek alternative ways of working, strengthening interinstitutional and interagency advocacy and efforts to encourage municipal and local health managers to continue their support for completing the unfinished agenda and promoting strategic partnerships. One example of this is the Latin American and Caribbean Newborn Health Alliance, established in 2005 as an effort between international agencies and programs, which are working together to reduce neonatal mortality in Latin America and the Caribbean. Another more recent example is the Pan American Alliance for Nutrition and Development, established in July 2008 at the initiative of several United Nations agencies led by PAHO. Its purpose is to coordi-

nate resources from the various agencies to help countries implement, monitor, and evaluate evidence-based multisectoral and interprogrammatic nutrition interventions with a multicausal approach to malnutrition.

An analysis of the six previous IMCI-TAG meetings reveals the achievements of the IMCI strategy, as well as its expansion with the addition of new components to address regional, national, and local epidemiological needs and situations. As I have said on other occasions, IMCI has proven to be a successful strategy that responds not only to current challenges but future challenges as well.

These public health interventions have helped improve many key global indicators. However, enormous disparities and gaps in health persist. For effective action to reduce these gaps, we must have a clear understanding of the multiple factors that affect health and aim at ambitious yet feasible goals that guarantee the achievement of the Millennium Development Goals by 2015 within the Primary Health Care Strategy.

**Dr. Mirta Roses Periago**

*Director*

Pan American Health Organization

Regional Office of the World Health Organization

Washington, D.C., U.S.A.



# 2 FOREWORD

## WELCOMING REMARKS

### Ann B. Stern

THC Executive Vice President, to IMCI-TAG members



Ann Stern

Welcome again to Houston, to the fifth meeting of this important technical group at Texas Children's Hospital (TCH) and a good occasion to come together. We are here again this morning as part of the long-standing commitment between the Pan American Health Organization (PAHO) and TCH to maternal and child health in the Region of the Americas and around the world.

Since our last meeting, the collaboration between PAHO and TCH has matured to new levels. Last year, the Neonatal Center and the THC International Operations group joined forces to establish and promote the vision, structure, staff, programs, and solidarity of the World Health Organization's Collaborating Center for Perinatal/Neonatal Health.

**This transformational partnership** between PAHO/WHO and Texas Children's Hospital focuses on the regions with the greatest need through interventions designed to tackle the most significant challenges in maternal and child health.

**The main purpose** of the center is to create sustainable and potentially effective operational interventions that will have a significant positive impact on maternal and child health through research, education, training programs, and the creation of effective partnerships. This year, the WHO Collaborating Center has launched initiatives in Peru and Guatemala, managing important projects.

**Key elements** such as operations research in Peru; the development and implementation of WHO best training practices in Central America, South America, and the Caribbean; and the establishment of a network project through a WHOCC school visit program at the global level.

The United Nations Millennium Development Goals, adopted in September 2000, proposed a clear trajectory for progress in poverty reduction, education, equality, and the environment.

In particular, three of the eight goals focus on health and health conditions: 1) combat HIV/AIDS and malaria, 2) reduce child mortality; specifically, reduce under-5 mortality by two-thirds, and 3) improve maternal health by reducing the maternal mortality rate by three-quarters.

Texas Children's Hospital (TCH) is committed to the creation of a global child health center and is also focused on finding solutions to these problems in particular. Our commitment to the goal of combating HIV/AIDS and malaria is present in the Baylor International Pediatric AIDS Initiative (BIPAI).

Established in 1996, BIPAI is the largest treatment program in the world. Devoted to improving the health and lives of HIV-positive children, BIPAI's mission is to provide a high-quality, high-impact, and highly ethical program. It also focuses on the care and treatment of families with HIV/AIDS, the training of health professionals, and clinical research.

Growth and expansion of care and treatment for children with HIV/AIDS are possible through the creation of a model of exemplary clinical care. The Children's Clinical Center of Excellence and its network link websites in order to share training models, knowledge, and best practices among professionals and serve as a catalyst for regional and global care and treatment of pediatric HIV/AIDS. BIPAI centers have been established in Romania, Botswana, Lesotho, Swaziland, Malawi, Uganda, Burkina Faso, and Tanzania.

In an effort to address the shortage of health professionals, BIPAI created the Pediatric AIDS Corps in June 2005. The Corps was designed as a measure to increase the care and treatment of HIV-positive children in sub-Saharan Africa and to complement the capacity of local health professionals. It has a two-part mission: to provide primary pediatric care and care and treatment for HIV/AIDS, and to train health professionals in Africa in the care and treatment of pediatric HIV/AIDS.

The dedication of Texas Children's Hospital to the goals of reducing infant mortality and improving maternal health is rooted not only in our commitment to excellence in patient care, education, and research, but also in our firm solidarity with PAHO.

Our history of collaboration is quite strong. We are very grateful to PAHO for the support that it provides every year in the International Colloquium, a major forum for the discussion of critical issues in pediatric health. Texas Children's Hospital considers it an honor to support the annual meeting of IMCI's Technical Advisory Group for the fifth time.

TCH was recently privileged to receive the news of our designation by WHO as a Collaborating Center for Perinatal/Neonatal Health. We feel truly honored by this special designation and feel an enormous responsibility to pursue opportunities for international collaboration in every way possible.

We also believe that this unique and extraordinary opportunity for collaboration came at the right time in the history of our institution, since we are advancing the frontiers of pediatric medicine through greater commitment to research, particularly in the causes of neurological diseases, and the expansion of patient care, which will include high-risk obstetrical care.

The Texas Children's Maternity Center, which is set to open in 2011, will provide a natural link to the care that we already provide in our second- and third-level intensive neonatal care units. The ability to create continuity in care between mother and child will have a great impact on the quality of care that will be provided to families in the early life of their children.

The Texas Children's Maternity Center will be a full-service maternity center within TCH that will provide comprehensive care for mothers and their children in a single facility. Areas of specialization will include reproductive endocrinology, infertility, fetal surgery, cardiology, and fetal neonatology.

Once the center is fully operational, there will be an estimated 5,000 births per year there, with a focus on high-risk births. The 720,000 m2 center will be connected to the main hospital and will have 15 floors and 102 beds.

With an increase in high-risk births regionally, nationally, and internationally, TCH has identified the need to expand maternity services for high-risk births. The nucleus of this philosophy is the revolutionary treatment of children before and immediately after birth.

TCH currently operates the largest level-three neonatal unit in the world. The addition to this project, which is a high-risk obstetrics program, will enable TCH to reorient its neonatal program to continue its growth and service to the community.

The Texas Children's Maternity Center will provide singular pediatric care to children who are about to be born and newborns with advanced treatment, complementing it with fetal surgery, fetal cardiology and genetics services, as well as the Neonatal Center.

IMCI was created largely because of the significant mortality that occurs in children during their first two months of life. Texas Children's Hospital is committed to continuing its strong partnership with IMCI, not only to advance patient care, education, and research, but also to share new knowledge, particularly in the areas of maternal and child health.

The continuing collaboration of PAHO and Texas Children's Hospital is welcome and essential. Our efforts are having a great impact and are sustainable, both of which are signs of work well done.

Thank you for your solidarity and attendance at this important meeting in Houston. Our plan is to hold a meeting over the next two days and continue the dynamic of working together.

**Ann B. Stern**

*Executive Vice President*

Texas Children's Hospital

## WELCOMING REMARKS

### Dr. Jesús Vallejo

to the Members of IMCI-TAG at the VII Meeting



**Dr. Jesus G. Vallejo**

It is a pleasure to welcome all of you and especially the Technical Advisory Group of the Pan American Health Organization to the Texas Children's Hospital and Baylor College of Medicine.

We are very grateful that Texas Children's Hospital has again been selected as the site for this important meeting. We offer our institutional support in the effort to identify America's pediatric health priorities.

Six weeks ago, I was named interim Medical Director of TCH International, and in this short time, I have learned that the collaboration and research programs resulting from the relationship between PAHO and TCH are very important. I personally admire what each of you is doing and want you to know that we are going to continue to do everything possible to help you achieve your objectives. Within the performance of my responsibilities, I hope to be able to participate in the WHO Collaborating Center, as well as in other projects between PAHO and TCH.

I feel very privileged to be here today and am grateful for the opportunity to participate in this forum. Once again, we welcome you and want you to know that we are honored by your presence. If there is anything we can do to make your stay more enjoyable, please let us know. I am looking forward to a very productive meeting.

### **Dr. Jesus G. Vallejo**

*Associate Professor*

Infectious Disease Section

Pediatrics Department

Baylor College of Medicine

Interim Medical Director of TCH International

## REMARKS

### Dr. Gina Tambini

Manager, Family and Community Health Area  
Pan American Health Organization  
World Health Organization (PAHO/WHO)



**Dr. Gina Tambini**

**O**n 20 November 2009, the 20th anniversary of the approval of the Convention on the Rights of the Child was observed around the world. The convention is a United Nations treaty, and the first international law on children's rights whose enforcement is mandatory for the States that have ratified it.

The convention covers civil, political, economic, social, and cultural rights, reflecting the different situations of children and adolescents around the world.

At the 49th Directing Council of the Pan American Health Organization, held 28 September–2 October 2009, an item on family and community health was taken up. This focus takes the view that the individual, the family, and the community deserve health care that not only addresses an individual's illness, but his or her relation with the family, the community and the environment as well. It respects community values, provides a participatory social management model for health care through the strategy of primary health care renewal, which includes the guiding principles of health system organization.

This leads us to reflect on the progress that we have made in the approaches and interventions needed to achieve the Millennium Development Goals and in our case, Numbers 4, 5 and 6 – on reducing mortality in children under 5, improving maternal health, and responding to the HIV/AIDS epidemic by 2015.

The maternal mortality rate has fallen by 26% in the Region, dropping from 180 to 130 deaths per 100,000 live births from 1990 to 2005, although major disparities persist among and within countries. The risk of maternal death was 16 times higher in Latin America than in Canada in 2008.

Child health continues to be a priority for every country in the Region and although we have reduced under-5 mortality from 42.4 in 1990 to 15.3 in 2008, a major challenge still remains. If the current downward trend continues without considering the social determinants of health within the framework of equity and interculturalism, many countries will not be able to achieve the United Nations' goals.

In addition, we continue to face new challenges, some of them devastating, such as the HIV/AIDS epidemic, where the number of infected children in Latin America and the Caribbean continues to rise, with an estimated 5,700 to 10,000 new infections. On another plane, the influenza A (H1N1) 2009 pandemic affects at-risk populations including pregnant women, children under 5, and especially, children under 2, as well as children with immunodeficiencies. These statistics should move us to redouble our efforts to prevent vertical transmission of HIV, which should be part of a joint plan and strategy based on the life course, in the context of ongoing treatment for mothers, newborns, and children.

Likewise, these activities should be coordinated with the prevention of congenital syphilis, from the inter-programmatic perspective of the programs for HIV/AIDS prevention, health care before and during pregnancy, sexual and reproductive health, and family and community health. At the same time, efforts to eradicate neonatal tetanus, Chagas' disease, rubella, congenital rubella syndrome, and measles should continue.

In light of these scenarios, the IMCI-TAG technical group will have to deliberate on how the IMCI strategy can continue supporting evidence-based interventions throughout the lifecourse so as to create healthy communities that, in turn, help create healthy families, thus ensuring better growth and development for newborns, children, and adolescents.

**Dra. Gina Tambini**

*Area Manager*

Family and Community Health

Pan American Health Organization

World Health Organization

Washington, D.C., USA

## 3

PURPOSES AND  
OBJECTIVES OF  
THE MEETING**BACKGROUND**

Since the launch of the Integrated Management of Childhood Illness (IMCI) strategy in 1996, it has received international recognition as an essential tool of great benefit to child health and improved care in health services as well as in the community and the home.

As a result of IMCI-strengthened actions, the infant mortality rates in the countries in the Region dropped by 50% from 1990 to 2008. Currently further reductions in neonatal mortality continue, in order to achieve the commitment of reducing the under-5 mortality rate by two-thirds, as proposed by the United Nations in 2000 through Millennium Development Goal Number 4, in a follow-up to "Healthy Children: Goal 2002."

In 2001, the Pan American Health Organization, with consent of its Director, established the Technical Advisory Group of the IMCI (IMCI-TAG), which has been responsible for reviewing and analyzing the progress of the IMCI strategy, and based on this progress, formulating recommendations for the process of establishing, adapting, and implementing the strategy in the Region of the Americas and prospects for its expansion.

In its meetings, the IMCI-TAG group has underscored that the IMCI strategy systematizes in an orderly and sequential approach the basic set of actions that should be implemented for the early detection and effective treatment of the diseases and health problems that affect children, their prevention, and the promotion of healthy conditions for growth and development.

It is necessary, as a result, to take maximum advantage of the progress countries have made in implementing IMCI, in order to accelerate the process of incorporating other evidence-based interventions and new IMCI components that help reduce under-5 morbidity and mortality in the Region, in the context of the integrated care approach in the maternal, newborn and child health continuum.

Due to the new challenges to ensure that evidence-based interventions are accepted and used in local programs throughout the countries of the Region and the fact that we now have new technology tools for information and training, in this 7th IMCI-TAG group meeting, new lines of action, activities and plans have been proposed to achieve these objectives, taking into account the world economic situation and its impact on health programs in the Region.

These efforts should target priority impact countries and reach the most vulnerable population groups, thus contributing to equity and reduction in the gaps between and within countries.

## **OBJECTIVES OF THE MEETING**

1. Analyze the diverse scenarios that favor or prevent the use of evidence-based medicine in the context of IMCI in local programs in the countries of the Region.
2. Identify the use of new tools and technologies to improve IMCI information and training and strengthen epidemiological information systems in the countries.
3. Propose lines of action, activities, and plans to introduce and strengthen new IMCI components, including components on pandemics and disasters.
4. Identify new regional and country-level opportunities to strengthen alliances and mobilize resources to expand the IMCI strategy.
5. Take into account the world economic situation and its impact on health programs in the Region of the Americas and the role of the IMCI strategy in the framework of the care continuum in this process.



## 4

REGIONAL PRIORITIES  
IN PEDIATRIC CARE**Dr. Yehuda Benguigui***Senior Adviser*

Child and Newborn Health

Family and Community Health

Healthy Life Course Project (FCH/HL)

PAHO/WHO, Washington, D.C.

**I. CONTEXT**

The current panorama of social exclusion in health in Latin America and the Caribbean shows that of 579,385 million inhabitants in 2007, 266 million (46%) did not have health insurance, 145 million (25%) did not have access to basic health services, there were 98 million births (17%) without care of qualified health workers, and approximately 680,000 children did not complete their DPT3 vaccination program. (1)

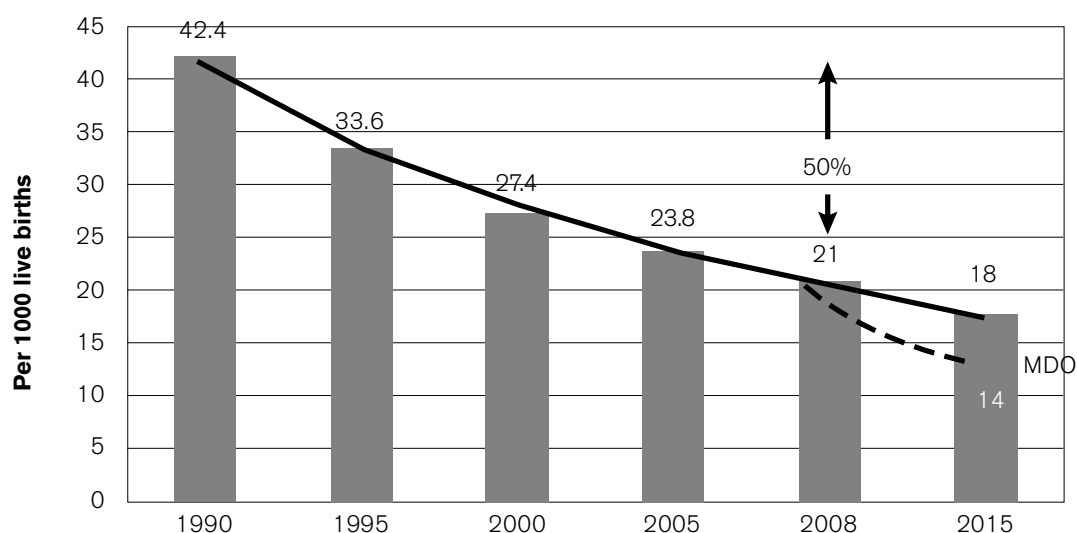
The Health Agenda for the Americas 2008-2017 focuses on four principles and values: 1) human rights, universality, access, and inclusion; 2) Pan American solidarity, 3) equity in health and 4) social participation. Ministers and Secretaries of Health in the Americas, meeting in Panama City on 3 July 2007, recognized that enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, or economic or social condition; and they urged all governments, civil society and the international community, which contribute to technical cooperation and development financing, to consider this Agenda as a guide and inspiration when developing public policies and implementing actions for health in pursuit of the well-being of the population of the Americas. (2)

In order to face these challenges, the primary health care renewal strategy as an integral part of the national health system, which constitutes the central function and the principal nucleus, as well as universal social and economic development of the community (3), provides support through four dimensions: ethics: providing greater equity in health and greater solidarity; policy: using regional health mandates on health for all and the Millennium Development Goals, as well as the right to health; social: carrying out intersectoral actions and supporting social and technical participation: ensuring universal health coverage, replacing individual-focused care models with a family and community approach, promoting comprehensive care; and finally, developing new profiles and skills for health workers.

## II. CURRENT OVERVIEW OF CHILD HEALTH

In the Region of the Americas in 2007, 323,962 children under 5 years of age died, the majority (73%) in the first year of life, and 58% in the first month of life. Nevertheless, progress over the last two decades has been great, the under-5 mortality rate has dropped by 50% from 1990 to 2008, which means that more than 300,000 deaths have been prevented (see Figure 1).

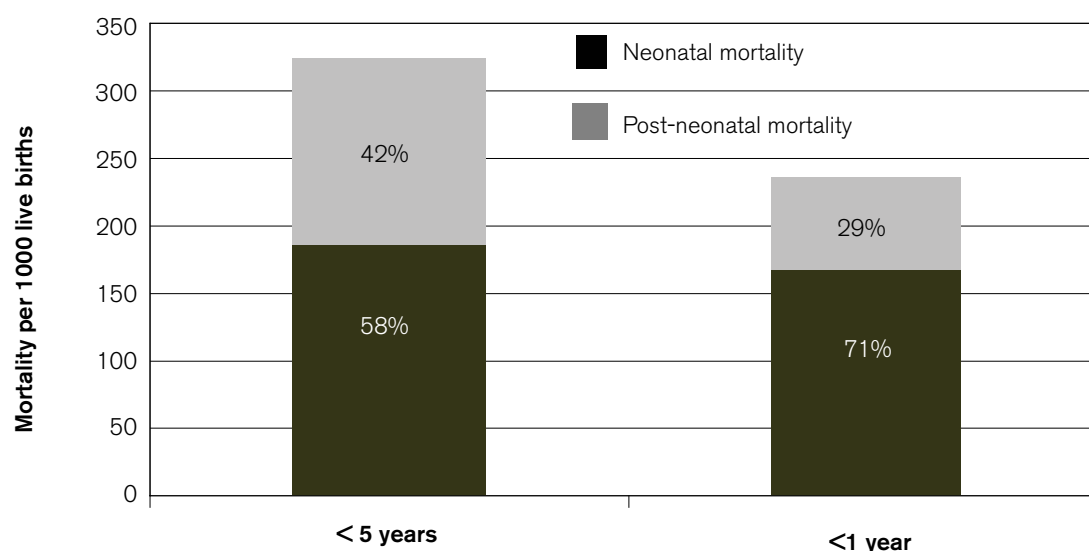
**Figure 1.** Evolution of the under-5 mortality rate in the Region of the Americas.  
(Rates per 1000 live births.)



Source: FCH/CA, PAHO/WHO estimates 2008

Mortality in the neonatal period continues to be because of avoidable pathologies for the most part such as the asphyxiation at birth, sepsis and the low weight. Infectious diseases, respiratory diseases, and malnutrition continue to affect children between 2 months and 4 years old, but with less effect on the global distribution of mortality. That is, the postneonatal component of infant mortality has been reduced, but not so in the neonatal period, which currently accounts for 71% of all deaths in children under 1 (see Figure 2).

In addition, progress in vaccination coverage is helping the Region of the Americas to eliminate measles, polio, neonatal tetanus, rubella and congenital rubella syndrome; and to reduce diphtheria and whooping cough.

**Figure 2.** Percentage of neonatal mortality in terms of total number of deaths in children under 5 and under 1.

Source: FCH/CA, PAHO/WHO estimates 2008

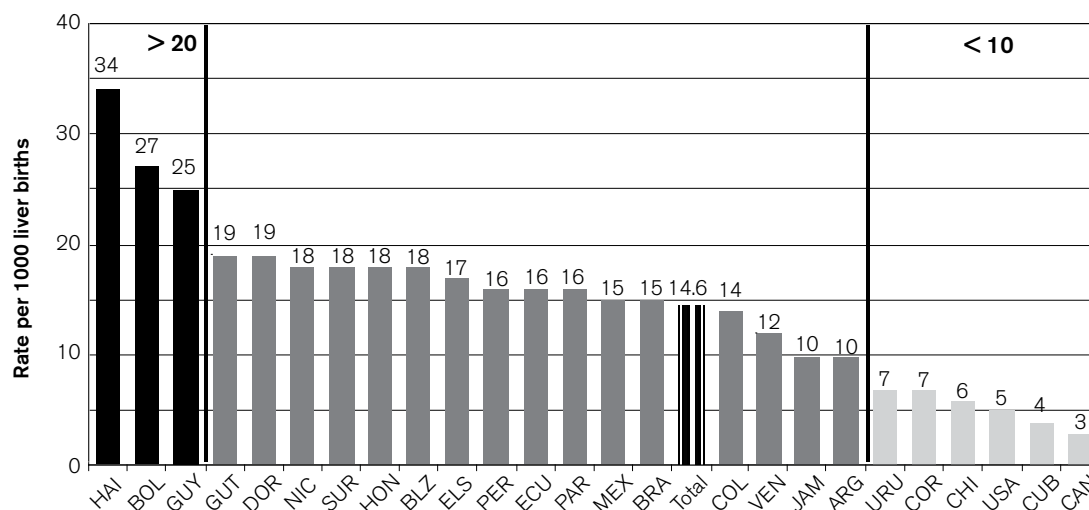
The vertical transmission of HIV/AIDS can be reduced to almost zero when appropriate evidence-based measures are taken, such as treatment of pregnant women, C-section deliveries, treatment of newborns, and suspension of breastfeeding. However, in the Region of Latin America and the Caribbean, an average still persists of 22% of HIV-infected newborns from HIV-positive mothers. Antiretroviral coverage in LAC has increased from 192,000 patients treated in 2002 to 445,000 in 2008.

### III. PRIORITIES IN CHILD HEALTH

Comparison of neonatal mortality in different countries of the Region of the Americas shows that three countries (HAI, BOL, GUY) have rates two to three times higher than in other countries. The general average has held steady at 14.6 per 1000 live births, with large in-country disparities in rates (see Figure 3).

Inequities in access to health services still persist in indigenous populations in some countries in the Region, where access to prenatal check-ups and skilled care during childbirth is half that in urban populations. These inequities – combined with illiteracy, poverty, and maternal nutritional status, among other factors – are determinants of maternal, neonatal and child survival and growth and adequate development during childhood.

Analysis of the leading causes of under-5 mortality reveals that 27% of all deaths resulted from respiratory diseases, diarrhea and malnutrition, which in 2008 represented more than 130,000 deaths. Pneumonia accounts for 17% of deaths in the world (4). This postneonatal reduction has produced a situation in which perinatal causes account for a greater proportion, representing 58% of total deaths in this period.

**Figure 3.** Neonatal mortality in countries in the Region of the Americas (per 1000 live births).

Source: FCH/CA estimates, based on data from ALS-PAHO 2007]

## IV. CHALLENGES AND NEXT STEPS

Based on the current epidemiological profile, PAHO should continue to promote the Regional Strategy and Plan of Action for Neonatal Health within the Continuum of Maternal, Newborn, and Child Care (5) and focus on four areas strategic: 1) create an enabling environment for neonatal health promotion, 2) strengthen health systems and improve access to maternal, newborn and childhood health care services, 3) promote community interventions and 4) create and strengthen surveillance, monitoring and evaluation systems.

In addition, the Global Action Plan for the Prevention and Control of Pneumonia (GAPP), proposed by WHO and UNICEF in 2007 and 2009 (6,7), aims at a 65% reduction in under-5 mortality from pneumonia and 25% reduction in severe pneumonia by 2015, compared with 2000 levels.

The Latin America and Caribbean Newborn Health Alliance was established in 2005 as a joint effort by international agencies and programs that work to reduce newborn mortality in Latin America and the Caribbean. One of the Newborn Health Alliance's main goals is to catalyze and strengthen intersectoral activities and interventions at local, national and regional levels, focusing specifically on the newborn period, which tends to be less visible in the context of the maternal and child health continuum process (8).

On 24-24 July 2008, at the Pan American Health Organization headquarters, the confirmation was approved of the Pan American Alliance on Nutrition and Development for the Achievement of the Millennium Development Goals, the purpose of which is to propose and implement comprehensive sustainable intersectoral programs, within the framework of human rights, with a focus on gender awareness and interculturalism, to accelerate the process of attaining the Millennium Development Goals (9).

To achieve the impact on reducing under-5 mortality by 2015, these interagency actions and those focused on reducing perinatal and neonatal mortality and mortality from prevalent diseases (ADD, ARI) should be accompanied by strategies to reduce morbidity and mortality from chronic diseases, vector-borne diseases, vaccine-preventable diseases, or the more prevalent diseases in every country or region. Major efforts also need to continue to eliminate such diseases as neonatal tetanus, Chagas disease, rubella, congenital rubella syndrome, syphilis and measles.

The process of integrating evidence-based interventions in each country, including them in national treatment protocols for maternal and newborn care (either alone or in packages in accordance with the care level provided by health systems), will make it possible to focus on the most prevalent conditions to reduce mortality (10). Furthermore, this approach enables more efficient use of resources, for care provided at different treatment levels.

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## 5

CHILD HEALTH AT THE  
GLOBAL LEVEL**Mark W. Kline, MD**

J.S. Abercrombie Professor and Chairman  
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Physician in Chief, Texas Children's Hospital



I would like to take this opportunity to refer to our international programs that provide global training in health for young physicians and our passion for HIV/AIDS, mainly in African and Eastern European countries. Many technological advances made in the United States have not been applied in poor countries. Texas Children's Hospital (TCH) has a broad program for HIV interventions in these countries.

Our work began in Romania in the mid-1990s, at the Kostanza Center of Romania, the largest pediatric AIDS treatment center in Europe. Treatment with ART will benefit all those children, whose growth has been stunted. In 2003, the center in Botswana opened, where annual treatment for more than 1200 children began.

The network of HIV centers where TCH currently collaborates and cooperates includes Lesotho, Malawi, Uganda, Kenya, Tanzania, Swaziland, Burkina Faso, and Benghazi Libya. Currently 40,000 children receive treatment, constituting the largest program in the world. We work with the host governments in an attempt not to compete with what the governmental institutions are already doing. All family members receive routine medical care in malnutrition and malaria prevention and control.

In an attempt to diversify our programs, we have been working on the rehabilitation of children with malnutrition or cancer, which accounts for 90% of mortality in Africa. Also in anemia of falciform cells, one of my passions, where hydroxyurea is effective, but we still need to test it in human environments.

The administrative umbrella and basic activities of the International Child Health center is the recruiting center for professionals in programs on malaria, HIV, respiratory problems, cancer and hematology. The center will soon provide surgery and treatment of tuberculosis, diarrhea, and malnutrition.

The International Child Health's residential program, the first of its kind in the United States, is a four-year program certified by the American Academy of Pediatrics. It also contains a tropical medicine cycle that in order for the resident to qualify for certification, he/she must complete with a lectures series and curricular studies in public health, a year in Africa and a research project. Currently there are five first-year residents and 100 applications were received within 48 hours after the official announcement was made. Some 100 physicians in the Pediatric AIDS Corps have been recruited in previous years and worked in Africa for at least a year.

More than 100 medical students have been sent abroad, associated with UNICEF, which has been a global partner in HIV/AIDS. We have also collaborated with the WHO in India.

I hope that a wide range of our initiatives will inspire many other professionals to follow a career in the Global Child Health Program (GCHP). I want to emphasize that we are very proud of our association with PAHO and UNICEF in care and treatment, and in health promotion and disease prevention programs. Recently, through a contract with UNICEF, we have worked in several countries around the world. When we provide assistance to a health organization, we are creating an enormous network with the SGAI. For example, we currently have a team in India conducting a survey on locally provided services for HIV-infected children, which we will present in a report to WHO with our recommendations on services for HIV-infected children in India, what components should be included and how can they be improved. We have undertaken similar evaluations in Sierra Leone, Nepal, Viet Nam, and other places around the world.

We are committed to global and international health and everything we do is in collaboration with other international organizations and the United Nations system. I firmly believe that we work better as a team than alone.

**Question: How has the use of informatics helped in the development of hospitals?**

**Dr. Kline:** One of the things that we have accomplished through our network, which we are very proud of, is implementation of an electronic medical record with support from TCH, so now we have the capacity to analyze the results of the work we do from the start. In Romania, one of the first databases that we worked with was a small one in the research office to sort and analyze patient data, so very soon we can show the results for children we are caring for in Romania. I believe this is one of the smartest things we have done because a lot of people have been sharing information on the benefits that the programs have been producing.

I can now show you that the mortality rate, which used to be 13%, has declined to 1% and we can continually update the data through the network. I can obtain monthly data mortality rates from all the centers. I can see precise data on how many patients we are caring for in each center, how many are hospitalized, how many have received some type of treatment, how many we have lost during the treatment, etc. A big investment was needed to achieve all this, but it has been extremely worthwhile for us.

**Question: Is there someone from outside the country who has come to support the trainings with your specialists? Is there any way in which the training in your programs could be provided by IMCI?**

**Dr. Kline:** The people we have trained not only work with local patients, they also provide information to other countries. All of them teach and implement IMCI. We always follow the treatment protocols of the centers and the PAHO guidelines in accordance with the WHO guidelines in these countries. Our spirit is not to create something different or to show that we know more, but to maintain work in harmony and accordance with these programs.



**Question: Laboratory facilities are a challenge in these countries. How have you resolved this problem in these centers?**

**Dr. Kline:** For now we have on basic laboratory facilities, but in Romania we have a reference laboratory located near the Midle Down Institute. It may not be of great interest in Romania, but for us it has been a great asset and for several years we have occupied an entire floor at the Biology Institute, and in such it is the largest laboratory that we have at the moment. We also have a reference laboratory in Malawi, Africa. In the other centers, we have basic services where we can conduct hematology, blood chemistry, and other examinations. We can also conduct PCR exams and other tests to diagnose HIV in children. We have debated about investing in laboratories, but currently we have no routine microbiology in our centers, so we seek support in other associated hospitals for these diagnoses.

**Question: Is there a chance that this program could be expanded to Latin America in the future?**

**Dr. Kline:** The work we have done in Latin America is mainly in Mexico. We have been working in a hospital in Mexico City for five years, for which we acquired a great deal of information on mother-child HIV transmission. Our educational curricula in Spanish were used to train 2000 to 3500 health workers in the clinic in Mexico City and in all major metropolitan areas.

We have conducted trainings in several Central American countries and recently with UNICEF and the Ministry of Health of Honduras, we sent a team to study the local situation and we are evaluating the possibilities of creating a children's center for all of Central America that can be used as a focal point to train professionals from Nicaragua, Guatemala, etc. and it would be the only center providing training. Thus, we have a great interest in Latin America. It never made sense to me to work with countries on the other side of the world and not with our neighbors. It is not logical. Of course, in terms of magnitude, Africa has been the focus of our attention. But if opportunities exist in Latin America, we are willing to hear about them. We would be delighted to have more opportunities in Latin America than we have had up to now.

**Question: In this case, are you working only with doctors from the USA or also from Latin America?**

**Dr. Kline:** It depends on what training you are referring to. If you are referring to the elective short-term training that we provide abroad, we have had participants from several Latin American countries and other countries around the world in a program of one to two years of work. We have had two physicians from Argentina, one from Brazil, two from Spain, etc., as well as many Europeans, so you can see that we accept requests from physicians around the world. In the World Health program, we accept applications from physicians who have graduated from U.S. medical schools as well as graduates from medical schools around the world, so long as they meet the requirements.



## 6

## DIVERSE SCENARIOS THAT FAVOR OR PREVENT THE USE OF EVIDENCE-BASED MEDICINE: Conclusions from the Neonatal Forum in Peru

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Of the 237,328 deaths of children in the Region of the Americas in 2008, more than 206,000 occurred in Latin America and the Caribbean and 192,935 were infants under 28 days old. Currently 71% of deaths of children less than 1 year of age occur during the neonatal period and more than 60% of these in the first seven days of life.

While under-1 mortality in Latin America and the Caribbean has declined up to 53%, neonatal mortality has remained almost unaltered for the last 10 years, mostly due to preventable causes such as perinatal asphyxiation, infections and complications from prematurity, and problems related to maternal condition, education and poverty. In the Region, neonatal mortality is twice as high among the most poor and marginalized, such as the indigenous populations in some countries (1).

After the launch in 2000 of the United Nation's Millennium Development Goals (2), the health and human development goals to be attained by 2015, great efforts have been made to improve the neonatal situation in Latin America and the Caribbean. Since then, the Pan American Health Organization has been promoting, training, and providing technical assistance, introducing a neonatal component into the Integrated Management of Childhood Illness (IMCI), producing generic material and adaptations in more than 14 countries in the Region.

The April 2005 New Delhi Declaration on Maternal, Newborn and Child Health is a call to action for countries to undertake activities to help saving the lives of mothers, newborns, and children. On 12 September 2005, the global Partnership for Maternal, Newborn and Child Health was officially launched, a reflection of the growing interest and global concern for this subject. At the regional level, in April 2005, the Newborn Health Alliance was forged in Latin America and the Caribbean where health ministry officials from 16 countries explored different actions to improve perinatal and neonatal health (3).

In a joint effort, countries have contributed to the implementation of neonatal IMCI, now widespread and known by the majority of professionals. In September 2006, the 47th Directing Council of PAHO and the 58th Session of the Regional Committee approved the "Neonatal Health in the Context of Maternal,

Newborn and Child Health for the Attainment of the Development Goals of the United Nations Millennium Declaration" (4). This plan served as a basis for the 48th Directing Council of PAHO, in its 60th Session of the Regional Committee, held from 29 September-3 October 2008, to approve the "Regional Strategy and Plan of Action for Neonatal Health Within the Continuum of Maternal, Newborn, and Child Care" (5).

Currently, the Latin American and Caribbean Newborn Health Alliance supports countries in their initiatives to reduce newborn morbidity and mortality in the Region through promoting the exchange of information and experiences at local, national and regional levels and the dissemination of cost-effective and evidence-based interventions, among other activities.

In 2005, *El Lancet* published an article describing the neonatal health situation in countries around the world, and proposing packages of evidence-based cost-effective interventions to save the lives of newborns (6). Currently there is a lot of discussion on the importance of quality neonatal care and its short-, medium- and long-term results, which includes not only providing every newborn with optimal care, but also updating the attitudes and practices of health workers to use evidence-based medicine that directly influences neonatal morbidity and mortality.

To this end, a technical group met in May 2008 in the city of Antigua Guatemala to update the contents of neonatal IMCI on the basis of evidence-based medicine, publishing a pamphlet entitled AIEPI Neonatal: Intervenciones Basadas en Evidencia en el contexto del continuo materno-recién nacido-niño menor de 2 meses ["Neonatal IMCI: Evidence-Based Interventions in the Context of the maternal-newborn-child under-2-months continuum"] (7). In the publication, interventions are proposed for before, during and after pregnancy, as well as during neonatal period, which directly influence neonatal results (see annex on interventions).

The third "Regional Technical Forum: Advancing Newborn Health Through Alliances" (held in Lima, Peru, 15-16 September 2009) had the following objectives:

1. Promote newborn health in Latin America and the Caribbean through interinstitutional initiatives, in the context of reproductive, maternal and child health continuum.
2. Promote evidence-based policies and programs focused on vulnerable populations.

One of the central ideas was that although simple, effective, evidence-based strategies do exist, the policies and programs applied in Latin America and the Caribbean still do not manage to include many of the interventions that have proven to save lives of mothers and newborns. In this forum, working groups discussed possible facilitating factors and limiting factors in the application of evidence-based interventions.

Limiting factors included:

- > Lack of involvement on the part of professional associations in dissemination and research of evidence-based neonatal interventions (EBNI).
- > Lack of qualified human resources.
- > Scarce availability of trained personnel.
- > Updating and disseminating EBNI care standards.
- > Resistance to change and few incentives for professionals.

- > Little or no follow-up and monitoring of interventions.
- > Lack of reliable statistical data for decision-making and planning.

Facilitating factors included:

- > Countries have begun to focus on the newborn and the need for taking action.
- > ALAPE, FLASOG, FEPEN have gotten involved in the dissemination and management of research in Latin America and the Caribbean.
- > For the most part, countries have maternal and neonatal care standards.
- > A regional plan to reduce maternal and neonatal mortality has been approved by all countries.
- > The Latin American and Caribbean Newborn Health Alliance has been established.

In conclusion, currently the knowledge and evidence-based interventions needed to prevent the majority of neonatal deaths already exist. The challenge for the Region is how to ensure that they are applied, effectively and universally. Not only it is important to have adequate obstetrics and neonatal care centers with the necessary personnel, equipment, and supplies, but also standards of care, protocols, and evidence-based clinical practice guides are needed, as well as ongoing in-service training of human resources for correct implementation. Systems are also needed for ongoing monitoring and follow-up of management and care as well as implementation of policies aimed at improving the motivation and incentives of human resources.

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**ANNEX. SUMMARY OF INTERVENTIONS AND MANAGEMENT**

Interventions	Management
<b>I. Interventions before pregnancy</b>	
1. Monitor nutritional status with Body Mass Index (BMI) prior to pregnancy	<b>When:</b> At each check-up <b>How:</b> weight (kg)/size (m <sup>2</sup> ) <b>Why:</b> Detect nutritional deficiencies <b>Treatment period:</b> at each check-up
2. Supplementary folic acid	<b>When:</b> Two months before pregnancy <b>How:</b> 400 mcg/day (0.4 mg), orally <b>Why:</b> Prevents neural tube abnormality and other anomalies <b>Treatment period:</b> Ongoing
3. Detect anemia and treat with iron	<b>When:</b> Pale or < 11 g/dl Hb <b>How:</b> 120 mg elemental iron /day, orally <b>Why:</b> Prevent anemia <b>Treatment period:</b> Until anemia resolved
4. Detect and treat sexually transmitted infections (HIV, herpes, gonococcus, papilloma, etc)	<b>When:</b> In health monitoring <b>How:</b> Medical and laboratory tests <b>Why:</b> Prevents birth defects and perinatal complications <b>Treatment period:</b> Depending on disease
5. Detect and treat chronic diseases (hypertension, diabetes, neuropathies, asthma, etc)	<b>When:</b> In health monitoring <b>How:</b> Medical and laboratory tests <b>Why:</b> Prevents birth defects and perinatal complications <b>Treatment period:</b> Depending on disease and protocols
<b>II. Interventions during pregnancy</b>	
1. Prenatal check-up	<b>When:</b> 5 check-ups during pregnancy <b>How:</b> according to WHO/PAHO standards <b>Why:</b> Prevent and detect risk <b>Treatment period:</b> during pregnancy
2. Use of clinical perinatal records and CLAP/SMR perinatal card	<b>When:</b> During prenatal check-up, delivery, puerperium, and neonatal phase <b>How:</b> according to CLAP/SMR standards <b>Why:</b> guarantee utilization of standards
3. Weight increase during pregnancy	<b>When:</b> Each prenatal check-up <b>Why:</b> Detect deviations in weight increase <b>Treatment period:</b> in each control
4. Immunization with tetanus toxoid based on previous vaccination status	<b>When:</b> 1st contact and 4 weeks later <b>How:</b> 0.5 ml, IM by dose <b>Why:</b> Prevent neonatal tetanus <b>Treatment period:</b> 2 doses or until completing 5 doses
5. Examination and treatment of syphilis cases	<b>When:</b> 1st contact and before delivery <b>How:</b> VDRL or RPR test <b>Why:</b> Prevent congenital syphilis <b>Treatment period:</b> 2.4 M of benzathine penicillin, a dose.

Interventions	Management
6. Detect and treat asymptomatic bacteriuria	<b>When:</b> 1st contact in less than 12 weeks, to the 28 and 32 weeks <b>How:</b> Reactive strips or urea culture <b>Why:</b> Prevents premature delivery, GNP, pyelonephritis. <b>Treatment period:</b> (cefalexin 500 mg every 8 hours, amoxicillin 500 mg every 8 hours, or cefadroxil, nitrofurantoin) for 7 to 10 days
7. Prevent and treat anemia with iron	<b>When:</b> Pale or < 11 g/dl Hb <b>How:</b> 120 mg iron/day, orally <b>Why:</b> Prevents anemia <b>Treatment period:</b> entire pregnancy and three postpartum months
8. Prevent preeclampsia and eclampsia with calcium	<b>When:</b> All pregnancies with risk of preeclampsia (< 3 parts milk derivatives per day or BMI <20 and >26 in 1st trimester) <b>How:</b> 1 -2 grams/day, orally <b>Why:</b> Prevents hypertension and preeclampsia <b>Treatment period:</b> Entire pregnancy
9. Prevent preeclampsia and eclampsia with aspirin	<b>When:</b> Every pregnancies with risk of preeclampsia (BMI >35 in 1st trimester) <b>How:</b> 75-100 mg/day, orally <b>Why:</b> Prevents preeclampsia, premature delivery, low birth-weight, and perinatal mortality <b>Treatment period:</b> Entire pregnancy
10. Detect and treat sexually transmitted infections	<b>When:</b> Prenatal check-ups <b>How:</b> Medical and laboratory evaluation <b>Why:</b> Prevents birth defects and perinatal complications <b>Treatment period:</b> Depends on type of infection
11. Detect and treat chronic diseases (hypertension, diabetes, neuropathies, asthma, etc)	<b>When:</b> Prenatal check-ups <b>How:</b> Medical and laboratory assessment <b>Why:</b> Prevents birth defects and perinatal complications <b>Treatment period:</b> Depending on disease and protocols
12. Deparasitize in highly prevalent areas	<b>When:</b> 2 <sup>o</sup> and 3rd trimester <b>How:</b> Albendazole 400 mg, orally, single dose <b>Why:</b> Prevents anemia <b>Treatment period:</b> one dose, twice
13. Detect and treat <i>streptococcus</i> B	<b>When:</b> During pregnancy <b>How:</b> Rectal and vaginal culture between 35th and 37th week <b>Why:</b> Prevents early neonatal infection from streptococcus B <b>Treatment period:</b> Intrapartum prophylactic: Penicillin G: 5 million units IV (initial dose), then 2.5 million units IV, c/4 hours up to delivery, or Ampicillin 2 g IV (initial dose) and then 1 g IV, c/4 hours up to delivery. In case of allergy to penicillin: Cefazolin 2 g IV (initial dose) and then 1g IV, c/8 hours up to delivery.
14. Detect and treat periodontal disease	<b>When:</b> 2 check-ups in pregnancy <b>How:</b> Dental check-up <b>Why:</b> Reduces prematurity <b>Treatment period:</b> Throughout pregnancy

Interventions	Management
15. Detect, prevent, and manage domestic violence	<b>When:</b> All the time <b>How:</b> Good family communication, psychosocial support <b>Why:</b> Prevents death or disabilities and emotional trauma <b>Treatment period:</b> Depending on case
<b>III. Interventions during delivery</b>	
1. Sterile and safe delivery practices (with qualified personnel)	<b>When:</b> At time of delivery <b>How:</b> Hand washing, clean instruments, enabling environment <b>Why:</b> Prevents infections <b>Treatment period:</b> During delivery and postpartum
2. Care for mother during labor and delivery	<b>When:</b> During labor and delivery <b>How:</b> Providing support for mother <b>Why:</b> Reduces obstetric complications
3. Erythromycin in RPM before delivery in < 37 weeks	<b>When:</b> Not in labor <b>How:</b> Erythromycin 500 mg, orally every 8 hours <b>Why:</b> Prevents premature birth, neonatal sepsis, chorioamnionitis <b>Treatment period:</b> 7 days
4. Nifedipine in premature labor	<b>When:</b> Premature labor <b>How:</b> 10 oral or sublingual mg <b>Why:</b> Prevents premature delivery, SDR, intraventricular hemorrhage, jaundice <b>Treatment period:</b> every 20 minutes for 3 doses in total
5. Prenatal corticosteroids (betamethasone, dexamethasone), to induce pulmonary maturation	<b>When:</b> From 26 to < 35 weeks EG <b>How:</b> BMT: 12 mg IM every 24 hours by 2 doses <b>DMT:</b> 6 mg IM every 12 hours by 4 doses <b>Why:</b> Reduces neonatal mortality, SDR, intraventricular hemorrhage, ECN, Sepsis <b>Treatment period:</b> Single cycle
6. Labor surveillance with partogram	<b>When:</b> During labor <b>How:</b> Using the Partogram <b>Why:</b> Reduces unnecessary interventions and perinatal complications <b>Treatment period:</b> During labor
7. Caesarean section in podalic presentation in newborns with BPN	<b>When:</b> During labor <b>How:</b> Elective Caesarean section <b>Why:</b> Reduces perinatal complications <b>Treatment period:</b> During labor
8. Zidovudine to reduce vertical transmission risk	<b>When:</b> During pregnancy and childbirth <b>How:</b> Zidovudine: <u>During pregnancy:</u> 100 mg VO 5 times a day beginning week 14-34 and continuing throughout pregnancy. <u>During delivery:</u> 2 mg/kg IV followed by continuous infusion of 1 mg/kg/hour up to delivery <b>Accompanied by:</b> elective C-section, education of parents and replace nursing with artificial formula <b>Why:</b> Reduces vertical transmission <b>Treatment period:</b> Up to completed delivery
9. Modified active management of the third period	<b>When:</b> During third part of delivery (childbirth) <b>How:</b> Oxytocin 5 to 10 IU, IM, or Methylergonovine 0.5 mg, IM, or misoprostol 0.4 to 0.8 mg, VO +traction/contraction + abdominal uterine massage <b>Why:</b> Reduces hemorrhaging <b>Treatment period:</b> Single dose



Interventions	Management
10. Late pinching of umbilical cord	<b>When:</b> During delivery, approximately 3 minutes <b>How:</b> Pinching <b>Why:</b> Prevents anemia during baby's first 4-6 months.
11. Neonatal resuscitation with ambient air	<b>When:</b> Immediately upon birth <b>How:</b> Following neonatal resuscitation plan <b>Why:</b> Prevents oxygen toxicity and sequelae ROP, bronchopulmonary dysplasia <b>Treatment period:</b> Up to 10 minutes
12. Immediate care for normal-birth infant	<b>When:</b> Immediately after birth <b>How:</b> Following the steps of immediate care <b>Why:</b> Prevents hypothermia, hypoglycemia
13. Care of umbilical cord	<b>When:</b> At birth and until cord falls off <b>How:</b> Initial antiseptic solution and then maintain clean and dry. <b>Why:</b> Prevents omphalitis and sepsis <b>Treatment period:</b> Until cord falls off
14. Care of skin at birth	<b>When:</b> Avoid immediate immersion bath <b>How:</b> Keep clean with sponge bath <b>Why:</b> Prevents hypothermia and infections <b>Treatment period:</b> Ongoing
<b>IV. Interventions after delivery</b>	
1. Neonatal screening for hypothyroidism	<b>When:</b> In the first 48 hours <b>How:</b> Blood of newborn (heel) <b>Why:</b> Early hypothyroidism diagnosis <b>Treatment period:</b> Immediate up to diagnosis
2. Detect and treat retinopathy in premature newborn	<b>When:</b> Between 4 to 6 weeks <b>How:</b> Ophthalmological evaluation <b>Why:</b> Prevents blindness <b>Treatment period:</b> Depends on degree of ROP
3. Early home visit for care of newborn	<b>When:</b> 1, 3, and 7 days after birth <b>How:</b> Evaluate essential neonatal care and confirm key practices. <b>Why:</b> Reduces neonatal mortality



# 7 IMCI DISTANCE LEARNING: EXPERIENCE IN PERU

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PAHO/WHO Peru

## BACKGROUND

Ever since IMCI was introduced in Peru in 1997, there has been an effort to accelerate the process of training health workers. With the support of Project 2000, financed by USAID, IMCI procedures were incorporated into an interactive CD. The CD, however, has not been widely accepted.

Later, in 2004, with support from the PAHO Regional Unit and the National University of San Marcos, the IMCI clinic was incorporated into a distance-learning version.

In this experience, the pilot study with health workers failed because of the participants' high dropout rate. However, it was well accepted by the students. Its limited use later was due to the fact that it was not updated, since already at that time, the IMCI clinic used in the country had incorporated the neonatal health content.

In 2008, thanks to support from the WHO and the Novartis Foundation, a technical team of the IMCI Training and Research Unit (TRU) at the National Institute of Child Health had the generic version of the ICATT (IMCI Computerized Adaptation and Training Tool) translated into Spanish. In December 2008 a pilot study was conducted with the CD with nursing students separated into two groups:

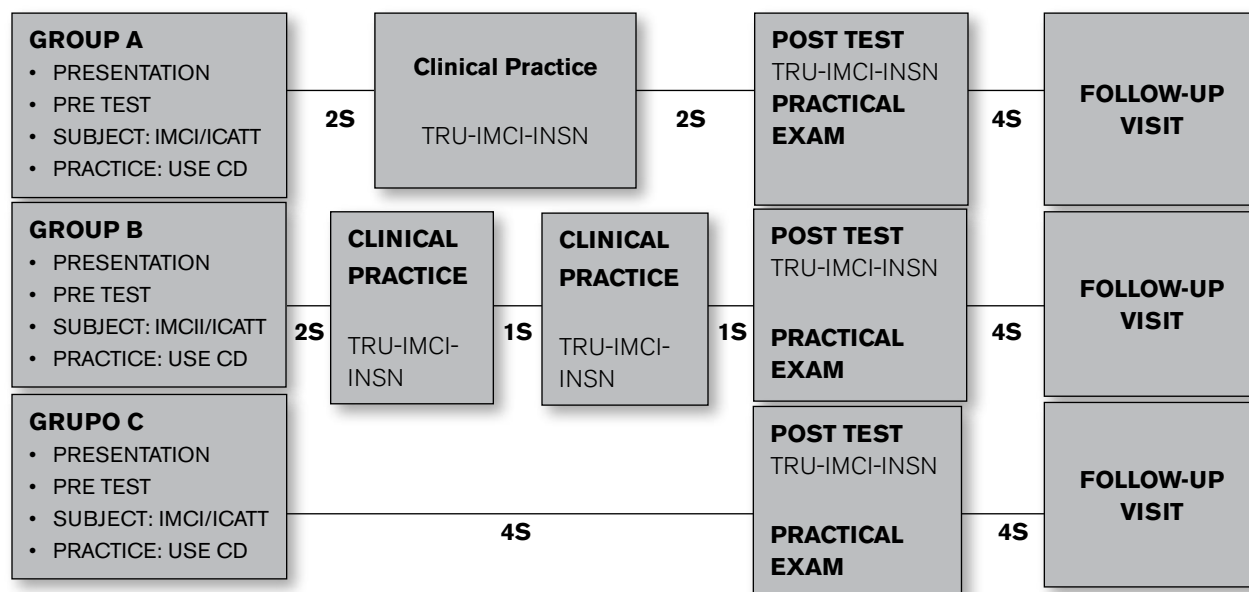
- > One group used multimedia
- > One group used personal computers.

At the same time, the Peruvian version of the IMCI clinical guidelines was adapted to include a focus on rights, and in 2009, a pilot study was conducted with health workers using this updated CD .

The ICATT is a multimedia CD ROM with four components or stations: Read, See, Practice and Evaluate. Its principal uses identified include: facilitate adaptation, ensure periodic updates, and expand training coverage.

A pilot study with the generic ICATT took place in December 2008 with a group of nursing students. In 2009, with the Peruvian version of ICATT, another pilot study was undertaken with a group of health workers in which the 36 participants (physicians, and nurses from the Tupac Amaru Network, close to Lima) were divided into three groups (A, B and C). The project began with an onsite meeting to show them how to use the CD ROM and then each participant underwent different clinical practices (as shown in Figure 1).



**Figure 1.** Pilot experience of health workers with ICATT, 2009

The four-week course concludes with a final test. A follow-up session with participants is also planned for four weeks later to evaluate the extent of IMCI incorporation into their daily practices.

Finally, we believe that the main challenges and prospects include: first, how to undertake a large-scale expansion, since preparation of macro-regional facilitators and skills development centers is needed to complement the necessary clinical practice prior to accreditation. The country has taken some steps in this direction. A second element is how to strengthen virtual tutoring during the course. Unfortunately, experience shows that our traditional facilitators need to be trained to play this new role. Third, the subject of clinical practice should be well planned since software helps a great deal to strengthen theoretical content and even makes it possible to go beyond the content normally presented in the courses, through a series of relevant examples for expanding and deepening knowledge. Finally, we believe that using available technologies calls for a new look at the profile of both the facilitators/tutors and the potential participants.

## 8

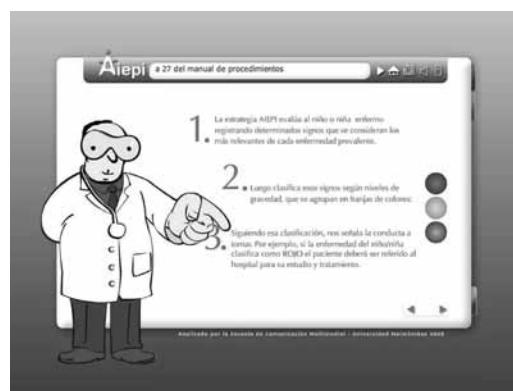
# IMCI DISTANCE-LEARNING: EXPERIENCE IN ARGENTINA

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Distance learning is an ideal alternative that is being incorporated into Maimonides University since the IMCI teaching is part of the health curriculum. One of the main problems is the fact that Latin America is training physicians in hospitals, and after finishing their studies, these same physicians then go work in private treatment centers.

For that reason, those who are involved with university education have to adapt to the change since they are part of the basic training of future doctors in their post-graduate studies and specialization.



For several years, many Latin America universities have begun to identify ways to correct curriculum deficiencies resulting from fragmentation, hospital-centered teaching, use of traditional pedagogic materials, and the general lack of community and human orientation in programs. The system is not preparing the physician that the community needs, and it is here where the IMCI strategy enables a concrete vision of the child, community and family. It promotes a communal mission, rational use of resources, and affective participation in the different areas of attention.

All those who have experience in education research know that different teaching strategies have unequal average attention rates. And the university has based the development of new learning strategies precisely on this factor. The master class has an average retention of only 5%, while hands-on practice has 75%. The curriculum updates have incorporated discussion groups, hands-on practice, and teaching others. The most recent curriculum change that was incorporated focused solely on pediatrics, where 64% of the 800 hours correspond to primary care and community activity. This is the basis that makes it possible for students to have the opportunity of the IMCI scenario, often learning on their own.

With the idea that each student owns his/her own learning and it is not the teacher's responsibility, traditional IMCI teaching with its training method is an unparalleled way to achieve our ideal proposal – that students can learn on their own. A multimedia site was prepared, supervised by specialized IMCI tutors, starting with the premise that where students really are going to learn is in the community, that is, give students the theoretical bases of the principles of IMCI strategy, but make it possible for them to learn in the same place where they are going to practice.

Before this, a brief evaluation was performed on 36 students who were trained with the CD; 35 passed the qualification and only one did not. Of the 35, all qualified correctly and only two had some difficulties filling in the form.

In conclusion, the self-teaching IMCI interactive CD, along with the Web version, provides the student with an important tool to learn and apply the fundamentals of the strategy in the local workplace.

## 9

## CARE OF THE AT-RISK CHILD

### Primary and Secondary Pediatric Care: Prognosis for the Profession


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**T**he problems in Latin America are the same problems around the world. Europe, Asia, and Oceania also have serious problems in the medical field: there are fewer pediatricians in the world and major problems loom in handle primary pediatric care.

It is good to remember that pediatricians have always been public health physicians and devoted to public health. The role of public health has always been in the hands of pediatricians. In the middle of the last century, the pediatrician's view began to shift such that public health was not perceived to be his domain. Sub-specialization opened a gap and the pediatrician was totally free, and so other specializations took charge of what is public medicine. This attitude is disappearing and the capacity for training in this field of public health has also been lost, and pediatricians are now realizing that they have to revisit it.

More than 100 years ago, Rudolph Virchow – a German physician, anthropologist, public health activist, pathologist, historian, biologist and politician – said that “medicine is a social science and politics is medicine on a large scale.” In a way, Virchow was the founder of social medicine, in his view that biological pathology not only defines disease and health, but also all issues related to social life.

In the coming years, it will probably be necessary to adjust to the demographic and socioeconomic changes of pediatrics and pediatric patients. This is occurring in Europe in a very severe way with emigration from Asian countries and the East, as well as changes in countries within Europe, where many people are migrating from one country to another, slightly changing each country's pathology. If the pediatrician is not familiar with that new pathology, he will have to relearn, study the technology of biomedical and technological advances, the new roads in pediatric health care service, payment systems, payments shared with medical insurers and the management of free or private medicine, the personal model in pediatrics. Pediatricians will begin to work more in groups, with management of working groups, and not each pediatrician alone in his own office.

The pediatrician will also have to be political and represent, or be the advocate of, his own patients in the government, in campaigns, in the news. Identify and face new problems, new trends, new roads and new

ideas that will arise in different pediatric specialties, especially the impressive changes that will occur in the next 10 years in pediatric education in general; the concept of teams and the subject of proficiency in family medicine.

Family medicine currently occupies a large part of what up to now the pediatrician has dealt with in primary care. Doctors need to begin to view the situation from the perspective of community physicians and not simply as primary-care physicians. The academic act or the fact of having academic conditions need to be improved not only in professional function but also in academic function, as well as professional conditions, with support from the society.

Differences exist between countries, and also within the same country, that require pediatric actions to adapt to demography, socioeconomic characteristics, culture and history, but above all, to the variety of pathologies present in a country in order to clarify the definitions of primary-care pediatrics or medicine that are accepted and published (1).

In general, primary-care treatment has to have a background, an initial contact with the patient or client, it has to be comprehensive, and above all, recognize the pathology and problems. Primary health care does not recognize who it is who should take charge, so a pediatrician can be a primary physician, a cardiologist can be a primary physician, a gynecologist can be a primary physician, but also a specialized nurse can be a primary care-giver or a mother or a group can provide primary care if they are taught and trained accordingly. The definitions are thus adaptable to every country or situation.

Secondary care is the care classically provided by hospital or clinic specialists who usually do not have primary contact with the patient, and therein the subject arises of how to make the passage from primary to secondary management. The third level, which in coming years is going to completely change, refers to highly competitive hospitals with complex technology, but that will possibly be managed within the community. From the standpoint of definitions, these are the definition that arose from a consensus of European pediatric societies seven or eight years ago when they defined what it means to be a pediatrician, a primary pediatrician, and a community pediatrician, where the community pediatrician is more closely related to the new pathology, the pathology of social mobilization with more medical schooling, more treatment of children with chronic diseases, all the problems of development and growth, not only understanding them but treating them as well; where primary medicine is not simply to cure but also to prevent acute and chronic diseases in an ambulatory – not hospital – environment.

It must be kept in mind that the term pediatrician is different in Europe, Asia, Oceania and Latin America. The pediatrician in Europe, especially the pediatrician in Eastern Europe, has been the student who completed medical school focused exclusively on pediatrics for six years and ended up with a degree in pediatrics, without knowing anything of general medicine. Today, universities in Eastern Europe are changing, are becoming more generalized, and the end product is that the medical student first becomes a general doctor, and afterwards in residency focuses on a specific specialization.

Why is primary medicine so much more important than second-level medicine and why is it necessary to handle it differently? Because not only is it logical, but also higher-quality health results and the end cost is much lower, increasing the ratio to one physician per every 10,000 population. If the physician is a specialist,

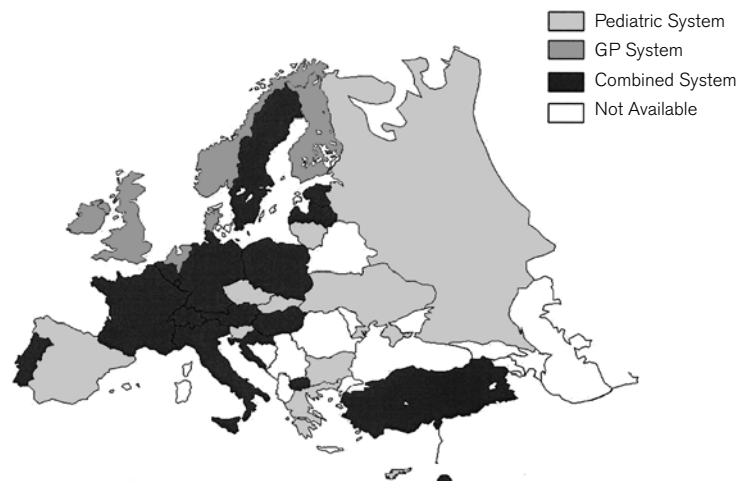


the quality of service is lower and costs increase by \$500 per beneficiary. If, instead of using a specialist and training a specialist, primary physicians are trained, the quality of service increases and costs drop by \$654 per beneficiary. Baker published these statistics in 2004 and he is an economist (2).

Seven years ago, and this still applies, we conducted a study in Europe with the European Pediatric Societies, which was published in *Pediatrics* in 2002 (3). We wanted to determine the status of pediatrics in Europe and we were able to determine the diversity, and lack of definition, when the president of each society in each country did not know what was happening in different areas in the same country. An analysis was also done on how many pediatricians there were, how they received medical training, who trained primary pediatricians and how many community pediatricians there were.

In Figure 1, the different color codes show three different pediatric systems: one is the pure pediatric system where the child is treated by a pediatrician; the second is the family medicine system, as in the Scandinavian countries, the Netherlands, the United Kingdom, and Ireland; and finally, countries in Central Europe with combination systems, where there are pediatricians and also family doctors who serve children. What is interesting is that when the country has more economic resources and the population has more money “per capita,” pediatric systems are less common.

**Figure 1.** Distribution of the pediatric systems in Europe in 1999



Source: Katz M, et al. *Pediatrics* 2002; 109:788-796

In terms of adolescent care, studies were conducted by the Society of European Adolescence and published in Pediatrics last year (4). In practical terms, it is very similar to what was published in 2002 on the demographics of pediatric management. To the extent that there is a lack of resources, infant mortality is higher, clearly. However, having more income is a protective factor for the child and there is reduced mortality, because the pediatric system also protects the child. If we combine all the data, which is what we did in this study, the presence of the pediatrician reduces infant mortality by almost 0.07 per every thousand, which is very significant in different countries around the world. There are different reasons why the medical system and the combination system fall short, the first being that the primary care system is terribly overloaded. For example, where we work in consultation clinics, an appointment lasts 5 to 7 minutes, and 12,000 to 13,000 children are seen per year and that is what each pediatrician is assigned.

In Italy or Spain, for example, it is practically the same simply because of the great shortage of pediatricians in the area and search for a pediatrician by the patient, the mother, father, or family in order to see who examines the child in different health systems. Of course, private medicine, which is ever more scarce in Europe, the United States and possibly Latin America, is also changing. It is also very clear what pediatric attention will become in the coming years in these countries. The operation of prepayment is totally nonfunctional. There are lines of physicians who wait for other physicians to come out of the system in order to enter and salaries continue to be very low.

Something is missing from specialization since it does not seem to be attractive to be a pediatrician at this time, even though there is a severe scarcity of trained pediatricians throughout the world. I would think that there should be some type of answer, but there is not. Of course, if everything is framed in an electronic system, with electronic records at a touch of a computer button and with management guides, it is made simpler and can result in very good quality of care. But unfortunately this cannot be done in all countries since it is very complex and costly. In the interface of primary and second-level care, there are three fundamental elements: information, decision-making, and the economic factor, and results must be appropriately measured; there must be initiative of consensus, it is necessary to try to give information to patients and try to have more primary care groups so that these types of initiatives are of the highest level.

This is a real problem throughout the world. There are fewer candidates in pediatric residencies and few academic positions at the community level. It is a very serious problem that should be resolved by whoever oversees pediatrics in the different countries. Pediatrics professors should give more academic positions to people who work at the community level by offering some type of academic incentive and the community-level posts should be occupied by family doctors who have some training and not by pediatricians. To achieve this, it is necessary to create new early experiences at the community level for medical students, promoting more monitoring and improving information and academic training for residents in pediatrics, as well as a greater focus on community pediatricians.

What happens in Europe, Asia, and Australia is a type of residence in common pediatrics that does not offer any primary-level or community activity during the 3 or 5 years of training. In 80% of the common hospital-based residencies, there is no community or primary-level medicine; there are very few countries special training in community medicine is offered, and there are only 3 or 4 countries in Europe that offer a type of optional training in community medicine. If all this is analyzed in other countries, it is highly probable that exactly the same or worse results will be found.

This same type of research could be undertaken in Latin America; to analyze what type of training do pediatricians receive, who are the pediatrician in Latin America, and how do they define themselves as pediatricians. Such studies would have to be based on cooperation and exchange of ideas in pediatric societies and regional groups.

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# 10 THE IMPACT OF THE ECONOMIC DETERIORATION ON HEALTH PROGRAMS

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## INTRODUCTION

I am going to begin with a very interesting analogy on monetary theory and the “baby-sitting recession” in Washington, D.C. The absolute increase of world economic productivity, through a great injection of dollars, caused the quantity of money available in the world in 10 years to triple as a result of increased productivity in Asia. Asian countries introduced their capital in world markets in order to multiply it; however, the multiplication of capital occurred through financial instruments that do not represent real productivity and loans implemented with the guarantee of unreal financial instruments resulted in mass bankruptcies.

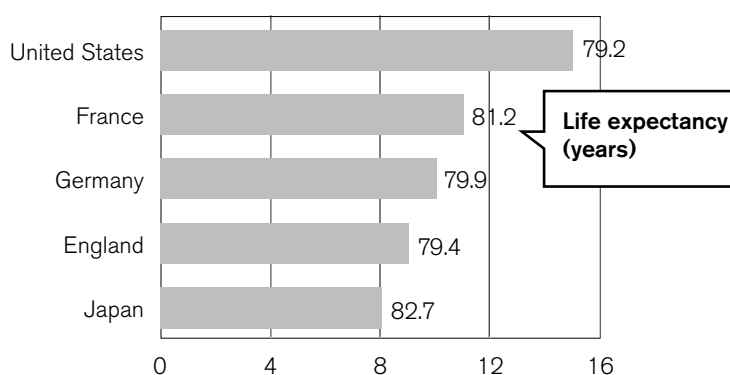
In Washington, 150 couples with children organized to provide baby-sitting for each other. Each couple received a coupon to purchase an hour of baby-sitting; in theory, each couple would provide as many hours of baby-sitting as they received. The couples with free nights and without plans to go out tried to hoard coupons for the future, offering baby-sitting; this hoarding occurred at the expense of other couples who emptied their reserves. The result was peculiar. The couples that felt that their reserves were insufficient wanted to babysit and were not willing to go out, which meant that the decision of a couple to go out was the opportunity for another couple to baby-sit. In this way, opportunities to baby-sit became scarce, creating a situation in which couples did not want to use their reserves and opportunities to provide baby-sitting became all the more scarce. The cooperative entered into recession because currency, the coupons, disappeared.

Meanwhile, when China begins to lower its consumption, its imports begin to decline and the surplus declines at the same time as in the Western world, and the gross national product of companies, governments and households is paralyzed or begins to decrease, and then the analogy that we have heard so many times becomes evident, that “when America sneezes, the rest of the world gets pneumonia.” Mexico's gross domestic product, with only a small percentage change year after year, began to decline abruptly in 2008, mainly at the expense of remittances sent home. When construction falls abruptly in the United States, the remittances sent by foreign construction workers no longer flow to their country. For example, in Guatemala the number-one category of income is remittances from the United States, and the number-two is agriculture. In Mexico, number-one is tourism and number-two is international remittances. In Mexico, savings as a percentage of disposable income declined from 7% in 1990 to almost zero in 2008, and debt per household as available percentage of income increased from zero in 1990 up to 120 in 2008.

## HEALTH EXPENDITURE

A whole series of established data has shown that not all health expenditure is necessarily health-related, but rather, related to health expenditure and how much physicians, hospitals, and the industrial health complex earn. Figure 1 illustrates the health expenditure in the United States compared with other industrialized countries. The United States comes close to 16% of expenditure and life expectancy is 79 years, compared, for example, with Japan, which spends half and life expectancy is practically three years more.

**Figure 1.** Total expenditure in health (public and private) as percentage of the gross domestic product and life expectancy in five selected countries.

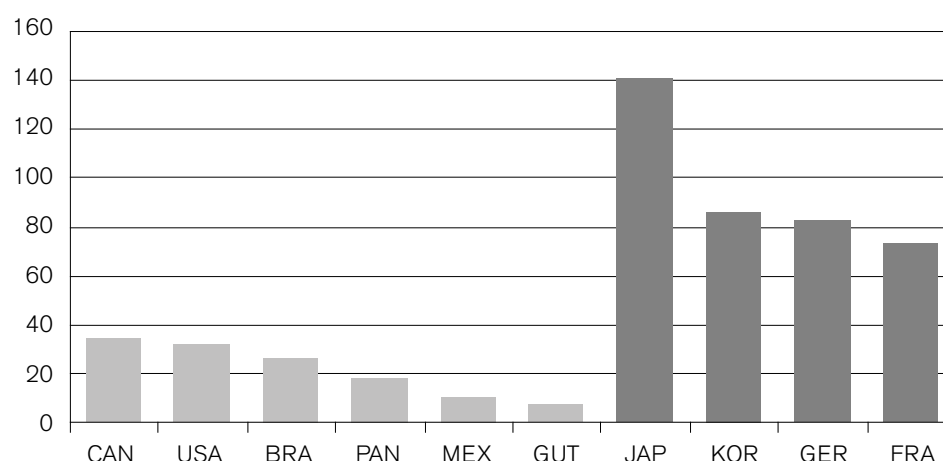


Source: OECD; UN, 2006

When the percentages of health costs related to public spending in countries such as Germany and Spain (which are above 14%) are compared with countries in Latin America and the Caribbean, the LAC countries have an expenditure below 4% (2). The same occurs when comparing the number of hospital beds per 10,000 people; for example, Japan has 140 and France 70, and in the Region of the Americas, Canada, which is the best, has 30 beds for every 10,000 people (3,4) (see Figure 2). These numbers come close to alarming in terms of care, at least of symptomatic diseases, but can be reflective of everything that is health in general.

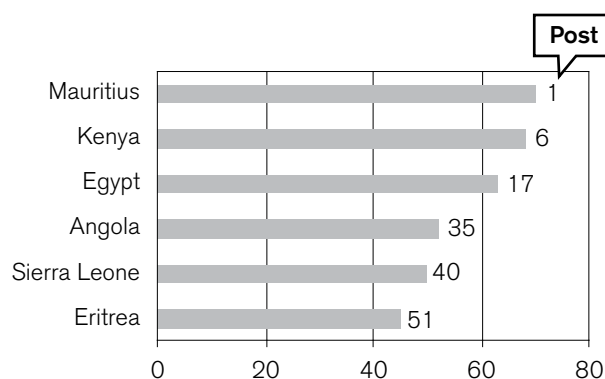
A change is currently being proposed in the administration of health-care in the United States, with an expenditure of more than one trillion dollars. Social attitudes toward these events are interesting, but in general it has been observed that the medical system and hospital system prefer certain anarchy and disparity of classes, rather than a regulation that will mandate rather than leaving things as the individual wants them to be.

**Figure 2.** Comparison of the number of hospital beds per every 10,000 people between different selected countries.



Source: ECLAC, 2009; World Bank, 2009.

**Figure 3.** Health policies for children in selected countries, with emphasis on African countries



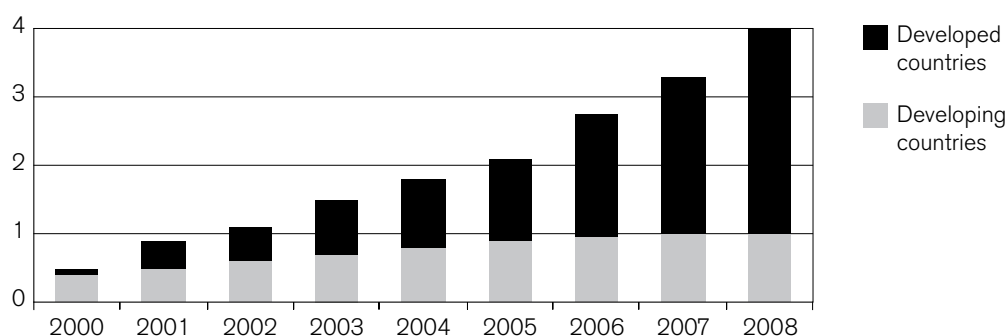
Source: African Child Policy Forum, 2008

The infrastructure of the American public health system has influenced the style of many health administrations throughout the region, because in a certain way, at the academic and educational levels, the U.S. model has tended to be a role model and be imitated in the Latin America region.

With respect to health policies for children, Figure 3 presents an example of how certain countries have policies that are kinder and favor the situation of the child. Mauritius is in first place with a favorable initiative; Egypt is in 17th place and from there the policies weaken as the severity of problems multiplies and scarcity is emphasized.

With regard to cellular telephones, one would expect that in areas where there is greater economic activity, subscriptions to cell phones would increase in those countries, as can be clearly seen in Figure 4, which compares the capability of growth in industrialized countries with that in developing countries.

**Figure 4.** Trend in annual cell phone subscriptions in developed countries, compared with developing countries.



*Fuente:* World Bank, 2009

A more in-depth look at the possible impact of the use of these technologies should take place in future meetings. Some studies show that when competition is introduced, the availability of technology shoots up (5). Those technologies based on portable electricity and that transfer images can be provided to all, even those who do not have electricity. They could support immediate low-cost effective decision-making in remote places.

An issue of the *New England Medical Journal* (6) refers to the importance of the cost of interventions and their effectiveness, saying that “relatively little rigorous evidence is available about which treatments work best for which patients or whether the benefits of more expensive treatments warrant their additional costs, which means that when it comes to the relationship between cost and effectiveness, it is usually the lower the cost, the more effective the treatment.” This had led me to consider that scant rigorous evidence exists to show the benefits of expensive treatment and justify the additional costs, since it has been seen that simple evidence-based interventions that cost very little have proven to significantly reduce morbidity and mortality in different environments.

Another problem has been the economic policy in control of the health authority, which is currently described as “governments and health ethics” referring to how budgets, contracts, purchases, etc. are determined. In a way, the cumulative effect of the G8 Group on economics and power has limited regional initiatives. We know that in health there is the individual's responsibility, as well as the responsibility of governments, nongovernmental organizations and philanthropic organizations. No one can currently deny that those who have at least in part assumed the responsibility have been the informal governments.



However, much of the aid that was destined for small businesses, small hospitals and small countries was instead, in order to restore the economy, channeled to large companies, insurers, banks and other corporations that difficult to access. The next step should be partnerships to be able to access assistance from these corporations.

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# 11 PANDEMIC INFLUENZA A (H1N1) 2009 AND IMCI: CONCLUSIONS OF THE TECHNICAL GROUP IN ANTIGUA, GUATEMALA

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## OBJECTIVE

The main objective of the meeting was to develop a generic protocol for the diagnosis, management, and treatment of influenza A (H1N1) 2009 based on IMCI methodology, to help countries in the Region of the Americas face the problem at the level of health services and the community.

To be able to develop the generic protocol, the following questions were explored and answered:

### 1. What is pandemic influenza A (H1N1) 2009 and what virus produces it?

Pandemic influenza A (H1N1) 2009 is a highly contagious respiratory disease caused by one of the porcine influenza A viruses. Transmission to humans is uncommon. However, transmission can occur through contact with infected pigs or an environment contaminated with swine flu virus. Once humans are infected, transmission between humans occurs just like the with virus of seasonal influenza.

Since the spring of 1977, two subtypes of the type A flu virus (H3N2 and H1N1) have been seasonally infecting the human population. Preliminary reports indicate that this new strain causes symptomatic disease in younger populations similar to the seasonal strains of H1N1.

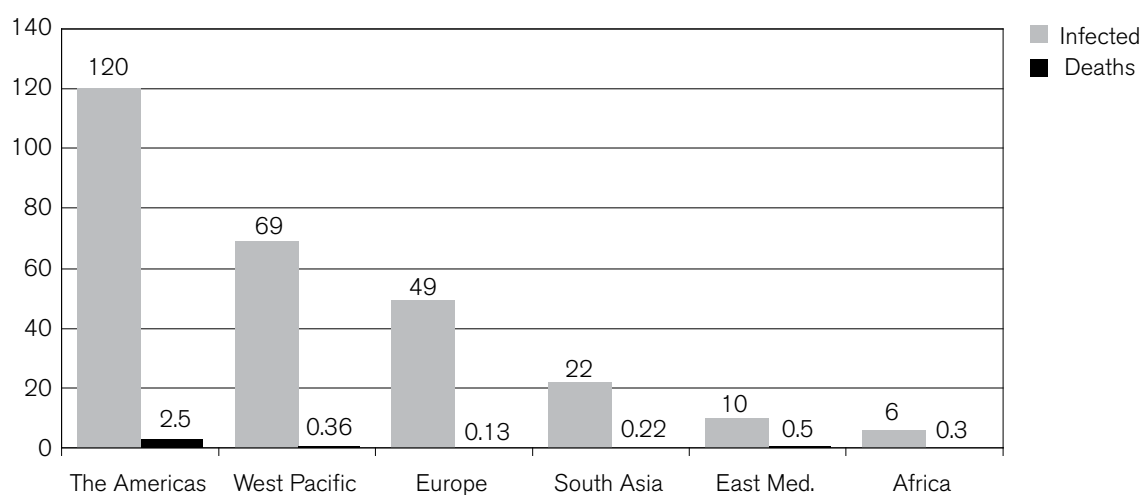
Influenza A (H1N1) 2009 is a pandemic caused by a variant of the A influenza virus of porcine origin (subtype H1N1). This new viral strain is known as swine flu (name initially given), North American flu (proposed by the World Animal Health Organization) and new flu (proposed by the European Union).

On 30 April 2009, the WHO decided to call it influenza A (H1N1). This is a description of the virus in which letter "A" designates the family of viruses of the human flu and of some animals such as pigs and birds, and the letters H and N (hemagglutinin and neuraminidase) correspond to the proteins. It is currently known as Influenza A (H1N1) Pandemic 2009 (1,2,3).

## 2. What is the current problem of influenza A (H1N1) worldwide and in the Region of the Americas?

In November 2009 the number of cases of influenza A (H1N1) in the world exceeded 300,000, and the number of deaths from this disease reached 6,071. Cases were present in 199 countries. America continued to be the region with the highest number of deaths, with 2,467 confirmed deaths and 120,653 cases (see Figure 1) (4,5).

**Figure 1.** Number of cases and percentage of deaths from pandemic influenza A (H1N1) 2009 in different regions around the world.



Source: WHO, September 2009.

## 3. Do management protocols for children under 5 exist for countries in the Region?

The Ministries of Health of some countries of the Region have been developing and promoting management protocols. But at the regional level, a generic instrument is not available to set guidelines, so that community-level and service-level health teams know and apply guidelines to manage patients under 5 with pandemic influenza A (H1N1) 2009.

The Integrated Management of Childhood Illness (IMCI) strategy, through its methodology and approach to addressing health problems, has been able to help reduce a series of prevalent illnesses in the countries. Influenza A (H1N1) 2009 is a universal pandemic that is affecting the majority of countries in the Region with different degrees of expansion and case-fatality. Taking into account the relevance of the IMCI strategy in this type of problem, the Pan American Health Organization invited a group of experts from different countries in the Region to develop in a short period of time a manual on management for children under 5, using the IMCI algorithms, with protocols and tables of procedures for diagnosis, management, and treat-

ment by health teams in the countries. The manual should place special attention on preventive measures to avoid contagious contact on the part of health workers, patients and children exposed at schools or day-care centers.

#### **4. What are the main symptoms and incubation period of influenza A (H1N1)?**

Seasonal flu viruses can cause illness in fall or winter, at the same time viral outbreaks of influenza A (H1N1) 2009 are occurring. Although the severity, volume and spread of the pandemic flu and seasonal flu in the coming years are unknown (the same is true for any flu season), some people will require medical care as a result of their infections or complications.

Flu symptoms, including the pandemic A (H1N1) 2009 flu, include fever, cough, sore throat, nasal secretion, body pain, headache, chills, fatigue, nausea, diarrhea, and vomiting. Since symptoms are nonspecific, based on symptoms alone it can be difficult to determine if a person has seasonal or pandemic flu. Nevertheless, in most cases, the decision for clinical management, in particular for outpatients, can be made based on clinical and epidemiological information or by following the IMCI algorithms on the basis of sensitivity and/or specificity.

In general, it is calculated that the incubation period for the flu is from 1 to 4 days, with an average of 2 days. The flu virus excretion begins the day previous to onset of the illness and can persist for 5 to 7 days, although some people, such as young children and critically immune-depressed individuals, can excrete the virus during longer periods. The quantity of elimination of the virus is greater on the second and third day of the illness and is accompanied by fever, with greater quantities of elimination when body temperatures are higher (6, 7).

#### **5. What is the treatment, and what should it be based on?**

The influenza A (H1N1) virus circulating since 2009 is sensitive to Oseltamivir and Zanamivir, but resistant to Amantadine and Rimantadine. The vast majority of healthy children with suspected or confirmed influenza A (H1N1) 2009 virus or who present an uncomplicated febrile condition will not require antiviral treatment (8, 9, 10).

The majority of people ill with influenza A (H1N1) virus will recover without complications. Some groups are at higher risk of suffering related complications and should be prioritized for antiviral drug treatment:

1. People with suspected or confirmed influenza who are at higher risk for complications, including:
  - > Children under 2
  - > Adults over 65
  - > Pregnant women
  - > Individuals with chronic medical conditions or immune-suppression.

2. People under 19 who have received long-term treatment with aspirin.

Children 2 to 4 years old have greater probabilities of requiring hospitalization or urgent medical evaluation for the influenza A (H1N1) virus as compared with older children, although the risk is much less than for children under 2. Children 2 to 4 years old without high-risk conditions and who are not critically sick do not necessarily require antiviral treatment.

The FDA has approved four vaccine preparations, with the following observations:

- > All flu vaccine preparations in the United States during the 2009-2010 season contain egg protein residue and none contains adjuvants.
- > Children 6 months to 9 years old who have laboratory-verified type A (H1N1) should receive two separate doses of monovalent vaccine over a period of 4 weeks; anyone over 10 should receive one dose.
- > The monovalent vaccines against type A (H1N1) flu were produced based on standards used for seasonal flu vaccines and have the same indications of age groups, precautions and contraindications as the FDA-approved seasonal flu vaccines; preliminary data indicates that the safety and efficacy of the monovalent vaccine for influenza A (H1N1) 2009 is the same as that of vaccines for seasonal flu.
- > Side effects, including localized pain at the injection site, have been reported in 46% of those vaccinated, and systemic reactions (headache, malaise or myalgia) in 45%; the safety profile is compatible with the experience of seasonal flu vaccine (11).

## 7. What are the preventive and control measures?

The transmission period extends from 24 hours before onset of symptoms to 5-7 days later. The virus can survive on hands for several minutes, on non-porous hard surfaces (plastic or stainless steel) for more than one day and in or on cloth, papers and handkerchiefs for several hours. For this reason it is necessary to step up habitual hygienic measures in places where several people live together.

The flu virus is transmitted from one person to another by means of droplets that we emit when speaking, coughing or sneezing. The droplets can remain on hands, hence it is necessary to avoid touching one's eyes, nose and mouth.

Day-care centers for children under 5 fundamentally represent a component in the epidemiological chain of the highest order since one of the age groups at greatest risk is concentrated there. Every effort to diminish morbidity of this pandemic should therefore incorporate these institutions.

## 8. What are the next steps?

- > Prepare the new generic IMCI pamphlet on the influenza A (H1N1) 2009 virus.
- > Get experts in the Region of the Americas to review the pamphlet.
- > Print the generic version.
- > Distribute to the countries.
- > Initiate the process of national adaptation.

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## EVALUATE AND CLASSIFY PANDEMIC INFLUENZA A (H1N1) 2009 IN CHILDREN 2 MONTHS TO 4 YEARS OLD

Does the child have sudden onset of fever and cough?

CLASSIFY		TREAT		EVALUATE	
<b>IF THE ANSWER IS YES, ASK:</b> - For how long? - Did child have contact in the last week with someone with flu? - Have you noticed rapid deterioration? Look for signs of danger: - Can baby drink or nurse? - Vomits everything ingested? - Convulsions? - Unusually sleepy and difficult to awake? <b>RISK FACTORS:-</b> Age 2-24 months. - Difficult access to health services. - Chronic pneumopathies, including asthma. - Heart disease. - Renal or liver diseases. - Neurological or neuromuscular diseases. - Diabetes or other metabolic diseases. - Immuno-suppressed, including neoplastic diseases and HIV. - Chronic malnutrition or obesity. - Diseases that require chronic treatment with steroids. - Minority subgroups such as indigenous population.	<b>OBSERVE</b> - Looks bad - Has worsened rapidly - Determine if child is breathing fast - Determine if child presents chest indrawing - Determine if O <sub>2</sub> saturation < 92% (whenever possible) <b>DETERMINE IF RISK FACTORS PRESENT</b>			One of the following: • Any general sign of danger or • Looks sick or • Has worsened rapidly or • Fast breathing or • Chest indrawing or • Saturation of oxygen <92%	<b>SEVERE PANDEMIC FLU</b> <ul style="list-style-type: none"> <li>Initiate antiviral treatment (Oseltamivir) as soon as possible</li> <li>Initiate first dose of Ampicillin or Amoxicillin</li> <li>Treat fever with Paracetamol (do not use aspirin)</li> <li>Administer oxygen</li> <li>Biosafety measures</li> <li>URGENT referral to hospital following the recommendations of stabilization and transport</li> </ul>
				Onset of fever and cough less than 48 hours and a risk factor	<b>PANDEMIC FLU WITH RISK FACTOR</b> <ul style="list-style-type: none"> <li>Initiate antiviral treatment (Oseltamivir) as soon as possible</li> <li>Treat fever with Paracetamol (do not use aspirin)</li> <li>Explain warning signs for immediate return to mother</li> <li>Explain care in the home to mother</li> <li>Follow-up visit in 2 days</li> <li>Follow national epidemiological surveillance recommendations</li> </ul>
				Does not meet criteria for classification in any of the above	<b>PANDEMIC FLU</b> <ul style="list-style-type: none"> <li>Treat fever with Paracetamol (do not use aspirin)</li> <li>Explain warning signs for immediate return to mother</li> <li>Explain home care to mother</li> <li>Follow-up visit in 2 days if fever persists</li> <li>Follow national epidemiological surveillance recommendations</li> </ul>



# 12 NEONATAL DERMATOLOGY AND IMCI: PROGRESS OF A PROPOSAL

## **Dr. Gerardo Cabrera-Meza**

Associate Professor of Pediatrics  
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**W**ithin the framework of the implementation of the new IMCI components based on the prevalence of certain diseases in different countries in the Region, generic manuals have been prepared for use in the processes of adapting clinical IMCI in the ambulatory management of primary health care in each country. Neonatal dermatology is broad and one of the principal pediatric consultations in the first days of life can be associated with severe systemic infections and even death. Its importance is often not recognized and health workers do not have the means within their reach for its evaluation, classification, treatment, and counseling for the family; which means that this component will be vitally important for the reduction of neonatal morbidity and mortality.

Dermatological problems during childhood may appear as a primary or secondary process in some systemic or genetic diseases. They currently constitute at least 5% of all pediatric consultations in outpatient clinics (1).

Dermatological manifestations are related to the patient's age, which means that in the neonatal period it is necessary to consider separately skin lesions in the neonatal period (a series of which are temporary and characteristic of this time of life and almost never need to be treated) and hereditary and infectious conditions that constitute a true emergency. An important percentage of the consultations after the first four weeks of life, such as atopic dermatitis, reaction to drugs, or contact dermatitis, are more prevalent.

After the neonatal period, most dermatological consultations are in the first year of life, when children begin to react to other types of allergens from food or physical contact. Diaper dermatitis produced from irritation or yeast infection, seborrheic dermatitis and atopic dermatitis are significant and can persist through adolescence or for the rest of life. Infections such as bacterial impetigo, where pruritus and scratching spread the infection, or exposure to insects during certain months, can become the principal reasons for consultation.

## **THE EPIDERMIS AFTER BIRTH**

Physiological mechanisms in the epidermis contribute to the formation of an interface adapted to the environment, including the activation of eccrine transpiration, production of fat, and rapid development of an acid

mantle. Physiologically, the epidermis and the differentiation of its end product, the horny stratum, remain in balance for the properties of renewal and auto cleaning, reflected in a distinct but firm dual process of cornification and desquamation. Together they preserve the functions of:

- > Barrier to water loss
- > Thermoregulation
- > Infection control
- > Immunological surveillance
- > Formation of acid mantle
- > Antioxidant function
- > Photo protection from ultraviolet light
- > Barrier to chemicals
- > Tactile discrimination
- > Attraction to contact with the caregiver

The premature newborn is vulnerable to disturbances in all these physiological mechanisms (2, 3).

## CUTANEOUS ALTERATIONS IN THE NEWBORN

A newborn's skin fulfills an extremely important role since it is the outer cover of the body and is constantly faced with pressures from the outside world, beginning at birth, such as changes in temperature, friction, microbes, etc. The structure and function of the skin depends on whether the infant is born full term or prematurely, which means that care of the skin is related to gestational age.

At birth, microbial colonization of the skin is almost nonexistent, but after a few days aerobic flora occupies the skin in different concentrations and at different sites. *Staphylococcus epidermidis* is the most commonly found microorganism. *Staphylococcus aureus* appears only from contamination, usually from the mother or health worker.

The newborn's protective but delicate cover needs to remain in healthy condition and should be altered as little as possible. Topical agents are absorbed faster by the newborn, due to the deficient intercellular bridges; and the relatively greater area of body surface compared with an adult facilitates the absorption and toxicity of substances applied topically. The newborn's sensitive skin cannot resist the toxicity of the majority of substances, which make it more susceptible to imbalance of liquids and electrolytes and thermal instability. The newborn's skin is very sensitive to cleaning agents that contain chemicals and need to be dried, which means that only products appropriate for newborns should be used.

The skin's pH is acidic and ranges between 4.5 and 6, according to the area. This acidic mantle intervenes in the inhibition of microbial proliferation. At the time of birth, the pH is neutral, and subsequently acidifies. The use of alkaline soaps temporarily increases the cutaneous pH and can cause irritation and infection (4).

## OBJECTIVE

To develop a generic protocol for diagnosis, management and treatment of dermatological problems in infants under two months old based on IMCI methodology, which can help countries in the Region of the Americas address the problems at the level of health services and the community.

### What are the newborn's main skin problems?

Transitory vesiculopustular skin rashes – such as toxic erythema in the newborn, neonatal acne and transitory neonatal pustular melanosis – can be clinically diagnosed based on appearance.

The most common pustular eruption during the first month of life is toxic erythema, which affects 40–70% of all newborns. Characteristic injuries are erythematous, with 2-3-mm papules that evolve to pustules on the face, trunk, and proximal section of the limbs. Each pustule is surrounded by an area of erythema.

Acne, which is present in almost one-fifth of newborns, is characterized by closed blackheads on the forehead, nose, and cheeks. Other locations, or the development of open blackheads with inflammatory papules and pustules, are less common.

Transitory neonatal pustular melanosis is a vesiculopustular rash that affects 5% of black newborns and less than 1% of white newborns. Unlike toxic erythema, the lesions of transitory neonatal pustular melanosis do not have any surrounding erythema, can break easily, and affect all areas of the body, including the palms and bottoms of feet. When skin rashes are accompanied by signs of systemic disease or when they present themselves in a strange way, Candida infection, virus, or bacteria should be ruled out.

In the newborn, the immaturity of the skin structures can give rise to milia and miliaria. The hot rash of the rubric miliaria usually improves with cooling. Milia, which is present in almost half of newborns, presents 1-2-mm white or yellow nacreous papules caused by the retention of keratin within the dermis. Usually they disappear spontaneously in the first month of life, but they can persist into the second or third months, so parents should receive counseling on their benign course and the fact that they disappear spontaneously. Miliaria is the result of the retention of perspiration caused by the partial closing of the eccrine structures. It occurs in up to 40% of infants and usually appears during the first month of life.

Seborrheic dermatitis, characterized by erythema and greasy scales, is prevalent during the first four weeks of life, and should be differentiated from atopic dermatitis. Seborrheic dermatitis occurs most frequently in the scalp, but can also affect the face, ears, and neck. The characteristics that help differentiate seborrheic dermatitis from atopic dermatitis during lactation include age at onset, which is generally within the first month in seborrheic dermatitis and after 3 months of age in atopic dermatitis. Seborrheic dermatitis disappears spontaneously and responds to treatment, while atopic dermatitis responds to treatment but relapses often occur. Seborrheic dermatitis affects scalp, face, ears, around the neck and diaper area, and atopic dermatitis affects scalp, face, trunk, limbs, and the diaper area. Pruritus is infrequent in seborrheic dermatitis but is very prevalent in atopic dermatitis (5-18).

### **How can the newborn's main skin problems be evaluated?**

All health professionals who provide care for infants should be able to identify common skin lesions and advise parents appropriately, since the newborn's skin can present a variety of changes during the course of the first four weeks of life. Most of these changes are benign and clear up spontaneously. But others require additional examinations in order to determine infectious etiologies or underlying systemic disorders. The vast majority of these skin alterations can be treated by parents in the home and evaluated in the follow-up consultation.

The parents should be questioned about the entire infectious history of the mother during pregnancy, since infections such as those causing the TORCH syndrome can be manifested at birth. Certain drugs ingested by the mother during pregnancy can also cause a dermatological disorder in the newborn. It is also important to know if the mother had fever at the end of her pregnancy or if the baby has had fever or convulsions, in order to determine a possible relationship of the lesions to the mother's infectious history (mainly viral). An important reference point in neonatal dermatological problems is the time of onset of the lesion(s), if they were there at the moment of birth, appeared shortly thereafter, or several days after birth.

### **How can the newborn's main skin problems be classified?**

As with other prevalent diseases, IMCI classifies risks by colors and does not consider diagnostics but classification of risk. Those pathologies that upon evaluation show signs of severity such as generalized purpuric lesions or widespread pustules, etc. should be classified red and referred immediately to more complex establishments to be evaluated by a specialist.

Most lesions – such as diaper dermatitis, candidiasis, seborrheic dermatitis, etc. – can be treated or observed in-house and do not require immediate reference unless they undergo considerable changes or show systemic complications. These lesions are classified as yellow.

All those lesions that are self-limiting or cure themselves – such as milia, miliaria, papules, or small vesicles – are classified as green and only require counseling and a follow-up visit.

### **How can the newborn's main skin problems be treated?**

Newborns who have vesiculopustular skin rashes and look sick should be evaluated clinically and undergo laboratory tests in order to rule out candidiasis and viral or bacterial infections. Infants with symptoms classified in red should be referred immediately to a hospital according to the standards of stabilization and transportation. Also, the first dose of one or two recommended antibiotics should be administered in the event that septicemia is suspected.

Although neonatal acne usually clears up within four months without scarring, in serious cases a lotion with benzoyl peroxide 2.5% can be applied at home by the parents. Seborrheic dermatitis usually disappears with a conservative treatment, such as the use of Vaseline, soft brushes and shampoo that contains tar. To treat seborrheic dermatitis that does not respond well to conservative management, topical antifungals or gentle corticosteroids can be used.

Other pathologies classified in green, such as miliaria rubra or rashes, usually clear up by avoiding overheating, removing excess clothing, and treatment with cool baths and air conditioning.

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# 13 CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

The Region of the Americas is made up of 48 countries with highly diverse geographical, social, cultural, and economic dimensions. The Region covers an extensive land area of almost 40 million square kilometers and its total population in 2008 was almost 940 million.

Currently progress in technology and information is advancing so quickly that alternative modes of dissemination are needed, through virtual libraries or networks, which can disseminate knowledge more quickly to more professionals. This also includes the information produced each year on the IMCI strategy – at the regional and country levels – which contributes daily to the enrichment of this library.

The IMCI-TAG technical group considers it important to integrate these types of present and future technologies. But the group is also aware of the global economic situation and its impact on health programs in the Region of the Americas and the role of the IMCI strategy in the ongoing framework of care in this process. As a result, the group is also seeking to identify new opportunities at the regional and country levels to strengthen alliances and mobilize alternative resources in order to expand the IMCI strategy.

No country, agency, or organization has been able to single-handedly address the problems of reducing maternal, neonatal and child mortality. The IMCI-TAG group recognizes the need to unite efforts toward this end and support the facilitation of these processes in order to achieve MDG-4 by 2015. IMCI-TAG proposes more widespread dissemination of the “Regional Strategy and Plan of Action for Neonatal Health Within the Continuum of Maternal, Newborn, and Child Care,” ratified by the Ministers of Health during the 48<sup>th</sup> Directing Council of the Pan American Health Organization, held in Washington, D.C, 29 September–3 October 2008. The group also emphasizes the importance of the countries in the Region in the promotion of the strategic areas proposed in the action plan, which will support even further the acceleration of the reduction in maternal, neonatal, and child mortality.

The group is concerned that although effective and low-cost interventions currently exist to reduce maternal, neonatal and child morbidity and mortality, assessment of the diverse scenarios in local programs in countries of the Region reveals that many of the existing interventions are not used or are only partially used. It appears that the Ministries of Public Health, health training schools, and academic associations in the countries do not give the interventions priority in the education of professionals and in their dissemination through local means. It is also important that countries consider neonatal actions in the framework of the continuum of maternal, newborn, and child care, within the context of the life cycle.

The technical group points out the important reduction in the profiles of the under-5 mortality rates in the countries of the Region, the majority due to the reduction in post-neonatal mortality. But the group considers

that it is important to accelerate, through different means, the process of reducing neonatal mortality, which has been neglected in the process. The group supports the efforts of the Latin America and the Caribbean Neonatal Health Alliance in their joint efforts to reduce newborn morbidity and mortality in the Region.

The IMCI-TAG group considers that IMCI, through training at all levels of care, continues to have great potential in identifying the use of new tools and technologies to improve information and IMCI training and strengthen epidemiological data in the countries, as a national program that supports all other programs currently underway.

The technical group considers that it is important to emphasize the focus on family and community health since, as put forth by the 49th Directing Council of the Pan American Health Organization (28 September–2 October 2009), the family is the basic unit of social organization and provides the initial environment and context in which knowledge, beliefs, attitudes and health practices are formed and established, as well as behavior in terms of seeking health care. Healthy families help create healthy communities, and in turn, healthy communities help create healthy families.

Since malnutrition (especially chronic malnutrition and anemia) is still a severe public health problem in Latin America and the Caribbean due to poverty and inequity in income and access to basic services, IMCI-TAG recognizes the importance of the Pan American Alliance for Nutrition and Development, approved at the Meeting of Regional Directors of the Agencies of the United Nations, 24–25 July 2008, at the Pan American Health Organization headquarters, the purpose of which is to propose and implement comprehensive, intersectoral, coordinated and sustainable programs within the framework of human rights, gender awareness, and interculturalism, in order to accelerate the process and ensure attainment of the Millennium Development Goals.

Primary care is an integral part of both the National Health System (which constitutes the central function and the principal nucleus) and social and economic development of the community. Primary care represents the first level of contact of individuals, families, and community with the national health system, bringing health care as close as possible to the place where people reside and work. Primary care constitutes the principal element of an ongoing health care process. For this reason, the technical group deems it essential that all proposed actions be framed within a focus of gender, ethnicity, health promotion and empowerment of mothers and families.

## RECOMMENDATIONS

### **1. *Various scenarios that favor or prevent use of evidence-based medicine in the context of IMCI.***

To help reduce maternal and neonatal morbidity and mortality in countries using evidence-based and cost-effective interventions, IMCI-TAG proposes to incorporate generic contents into the programs and standards of care, adapting each case to its own reality. It also suggests that the consensus achieved and endorsed at the Neonatal Forum of Lima in September 2009 be disseminated. There, the Latin American Association of Pediatrics (ALAPE), the Latin American Federation of Societies of Gynecology and Obstetrics (FLASOG),



the International Confederation of Midwives (ICM), and the Latin American Association of Schools and Colleges of Nursing (ALADEFE) agreed to support vocational schools for health workers and help national associations and the Ministries of Health incorporate and disseminate evidence-based interventions through all media within their reach.

## **2. Use of new tools and technologies to improve IMCI information and training and strengthen epidemiological information in countries.**

Given the global economic situation and its impact on health programs in the Region of the Americas and the role of the IMCI, the group recommended investing less in high-cost technologies and taking greater advantage of human resources, strengthening advocacy for IMCI based on local/municipal health managers and strengthening intersectoral and interinstitutional efforts through involvement of volunteers who undertake service missions throughout the Region of Latin America and the Caribbean to promote healthy practices and the IMCI strategy as a whole, and in this way avoid missed opportunities. However, the group recommends that access to information on IMCI be promoted through use of virtual libraries, interactive distance learning courses, cell phone technology, or distribution of CDs, which are low-cost, free circulation, and almost universal access, without completely abandoning onsite training, which for the time being, continues to be acceptable and to have greater impact.

## **3. Lines of action, activities, and plans for introducing and strengthening new IMCI components, including components on pandemics and disasters.**

- a. New IMCI components:** IMCI-TAG continues to recognize that the incorporation of new IMCI components such as the influenza A (H1N1) 2009 pandemic, IMCI neonatal dermatology and other components according to epidemiological profiles is an appropriate strategy to achieve institutional and governmental commitment to IMCI expansion, since it responds to the national operating conditions and local plans to reduce maternal and under-5 mortality, with a view to achieving the MDGs by 2015. Furthermore, the group calls for continuing the efforts made to date to incorporate the IMCI strategy into medical, nursing and public health school curricula and other programmed academic activities.
- a. IMCI and Nursing:** The technical group also recognizes the importance of incorporating the IMCI nursing component and its expansion in priority and high-impact countries in Latin America and the Caribbean, and it recommends strengthening and expanding national training and adaptations, in order to strengthen the Network for Nursing in Child Health and achieve greater impact and active participation, not only in incorporating new evidence-based strategies, but in improvements in the technical, professional and trade-union levels. The technical group therefore expresses its approval of the participation of nurses as IMCI-TAG members.
- a. Pandemics and disasters:** Recognizing the importance of the AAP materials on medical care during natural disasters within the context of IMCI, the group recommends the development of implementation methods and training of facilitators as soon as possible, through clinical and practical workshops, in direct cooperation with the Ministries of Health in the countries and training schools. The group also recommends that the topic of the influenza A (H1N1) epidemic 2009 be included in the manual.

- a. *Child development and violence:*** Progress needs to be made in strengthening and promoting the child development component in the countries, along specific lines of disabilities and development. The group also proposes that the issue of violence be incorporated in this process in all stages of the life cycle.

#### **4. *New opportunities at the regional and country levels to strengthen alliances and mobilize resources for expanding the IMCI strategy.***

Support the goals and objectives that the Latin America and Caribbean Neonatal Alliance has been catalyzing and strengthen local, national, and regional intersectoral activities and interventions, focused specifically on the neonatal period, which is the least visible in the context of the maternal-child continuum. This mechanism will help strengthen financing of programs that implement the IMCI strategy and prepare cooperative plans and projects that help strengthen its expansion, with a view to reducing under-5 mortality in the Region of the Americas.

#### **5. *The world economic situation and its impact on health programs in the Region of the Americas and the role of the IMCI strategy in this process.***

The group recommends that the IMCI should invest less in high-cost technologies and more in human resources, strengthening advocacy for IMCI through municipal/local health managers and strengthening intersectoral and interinstitutional efforts. IMCI-TAG proposes identifying and interacting with other cooperation agencies already present in the countries that work actively with the same objectives and have relations with other NGOs with established networks, as well as agencies and organizations that go the countries and provide support through volunteers. Such ties maximize the joint actions of PAHO, the Ministries of Health, and NGOs with a view to achieving the commitment to promote healthy practices and disseminate the IMCI strategy as a whole and therefore avoid missed opportunities.

Promote the commitment acquired by professional, academic, and scientific groups, led by ALAPE, FLASOG, ICM, ALADEFE, through the governmental and nongovernmental institutions and other local private institutions, in order to sustain, strengthen and expand IMCI programs.

Through social communication strategies, strengthen the population's active participation in improving the health of and empowering the mother, newborn and child through key practices and recognition of early warning signs.

#### **6. *Human resources training schools.***

Promote a new country-level survey of the chairs of pediatrics at medical schools throughout the Region of Latin America and the Caribbean and compare the data with the survey conducted in 2000 by PAHO and ALAPE.

### **7. Nongovernmental organizations.**

Prioritize the joint efforts with NGOs active in the countries, preparing an inventory of U.S.-based NGOs and plan a call for participation, taking advantage of the TCH and AAP's offer for the meeting they are planning for this purpose during the AAP conference in San Francisco in 2010.

### **8. Operational priorities.**

Work over the next two years work with the priority and impact countries to reach vulnerable and indigenous and neglected populations and to implement: 1) the Regional Plan of Action for Neonatal Health according to the document approved by the 48th Directing Council of the Pan American Health Organization (29 September–3 October 2008), expanding it from seven to 15 countries; 2) Child Health Profile in the countries, to expand completed profiles from four to 12 countries; and 3) the neonatal IMCI methodology of follow-up and monitoring in health facilities, expanding the number of countries using the instruments from five to fifteen.

### **9. Evidence-based neonatal interventions (EBNI).**

Update the Regional guideline document to include the Neonatal IMCI Table of Procedures, and disseminate it in the priority and impact countries to be implemented in basic health care and reference services.

### **10. Millennium Development Goal No. 4.**

Call a meeting to evaluate the first 10 years of MDG-4 and the strategic priorities for the next five years to achieve the goal by 2015. The meeting should include the interagency regional Neonatal Alliance as sponsor, international agencies, bilateral organizations, NGOs, the WHO Collaborating Centers and the Ministries of Health. IMCI-TAG recommends that the meeting be held in the first quarter of 2011.



# 14 ANNEXES

## AGENDA OF THE MEETING

### FIRST DAY: TUESDAY 10 NOVEMBER 2009

8:00-8:15	Transfer to Texas Children's Hospital
8:15-8:45	Breakfast (Trevisio)
8:45-9:00	Welcoming remarks: Ann B. Stern, Executive Vice President, Texas Children's Hospital
9:05-9:15	Inauguration and introduction of the participants Dr. Yehuda Benguigui, Child and Adolescent Health Unit, Family and Community Health Area, PAHO/WHO. Dr. Jesus Vallejo, Interim Medical Director, International Services, Texas Children's Hospital
9:15-9:45	Description of the mechanics of the meeting, designation of the coordinator and rapporteur, and adoption of the agenda.
9:45-10:05	Presentation: Regional Priorities in Pediatric Care, Dr. Yehuda Benguigui.
10:05-10:25	Presentation: Child Health at the Global Level (Topic TBD) Mark W. Kline, M.D. J.S. Abercrombie Professor and Chairman, Department of Pediatrics, Baylor College of Medicine Physician-in-Chief, Texas Children's Hospital
10:25-10:45	Presentation: Various scenarios that favor or prevent the use of evidence-based medicine: conclusions of the Neonatal Forum in Peru. Dr. Rolando Cerezo, INCAP/PAHO.
10:45-11:00	Break
11:00-12:00	Working Group 1: Analysis of the various scenarios that favor or prevent the use of evidence-based medicine in the context of IMCI in local programs in the countries of the Region.
12:00-12:30	Plenary discussion and preparation of the recommendations of Working Group 1.
12:30-12:45	Presentation: IMCI distance-learning: experience of Argentina, Dr. Arnoldo Grosman
12:45-13:00	Presentation: IMCI distance-learning: experience of Peru, Dr. Miguel Dávila, PAHO/WHO consultant, Peru.
13:00-14:00	Luncheon
14:00-15:00	Working Group 2: Identify the use of new tools and technologies in order to improve the information and training in IMCI and strengthen the epidemiological information systems of countries.
15:00-15:30	Plenary discussion and preparation of the recommendations of Working Group 2 .
15:30-15:45	Break
15:45-16:30	Working Group 3: Proposals of lines of action, activities, and plans for introducing and strengthening new IMCI components, including components on pandemics and disasters.

16:30-17:00	Plenary discussion and preparation of the recommendations of Working Group 3.
17:00	Return to hotel
18:30-21:00	Dinner hosted by Texas Children's Hospital

## SECOND DAY: WEDNESDAY 11 NOVEMBER 2009

8:00-8:15	Transfer to Texas Children's Hospital
8:15-8:45	Breakfast (Trevisio)
8:45-9:00	Audit of the process of the meeting
9:05-9:20	Presentation: IMCI terminology. Dr. Rolando Cerezo
9:20-9:40	Presentation: H1N1 in the context of IMCI: conclusions of the working group of the workshop in Antigua, Guatemala. Dr. Rolando Cerezo
9:40-10:00	Presentation: Neonatal Dermatology and IMCI (progress). Dr. Gerardo Cabrera-Meza, Texas Children's Hospital
10:00-11:00	Working Group 4: Identification of new opportunities at regional and country levels to strengthen alliances and mobilize resources to expand IMCI strategy.
11:00-11:15	Break
11:15-11:40	Plenary discussion and preparation of the recommendations of Working Group 4.
11:40-12:00	Presentation: "The world economic situation and its impact on health programs" Dr. Fernando Stein, Member, IMCI-TAG.
12:00-13:00	Working Group 5: Analysis of global economic situation and its impact on health programs in the Region of the Americas and the role of the IMCI strategy in this process.
13:00-14:00	Luncheon
14:00-14:30	Plenary discussion and preparation of the recommendations of Working Group 5.
14:30-15:15	Preparation of the recommendations of the meeting.
15:15-15:30	Review and complementation of the working groups' recommendations.
15:30-15:45	Break
15:45-16:45	Reading, discussion, and approval of final document.
16:45-17:00	Closure: Dr. Jesus Vallejo, Interim Medical Director, International Services, Texas Children's Hospital Dr. Yehuda Benguigui, Child and Adolescent Health, Family and Community Health, PAHO/WHO.
17:00	Return to hotel

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**Pan American  
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*Regional Office of the  
World Health Organization*

**Integrated Management of Childhood Illness (IMCI)  
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