Chapter 26

Early Child Development: Health Equity From the Start in Chile

Helia Molina, MD, MPH
Miguel Cordero Vega, MS
Judith Palfrey, MD, FAAP
Paula Bedregal, MD, MPH, PhD
MaryCatherine Arbour, MD, MPH

Understanding the Problem

In its definition of *health,* the World Health Organization (WHO) includes development and function, emotion, and behavior.[1] A healthy child is one whose world opens up each day to new experiences, cognitive exploration, capacities, productivity, and ultimately a kind of societal belonging and citizenship. Health and development are tightly linked, with clearly established biologic explanations for the relationship. During early childhood more than 100 billion neurons are developed and connect to configure neural pathways and brain networks through the interaction of genetics, environment, and experience.[2,3] Children who experience toxic stress—prolonged exposure to stressful experiences not mitigated by relationships with supportive, loving adults—are at risk for long-term deficits in cognition and function.[4] Birth-related injuries, chronic disease, malnutrition, and infectious disease can all contribute to poor cognitive development, as can lack of stimulation, maternal depression, and exposure to violence.

As with infant and child mortality and morbidity, the developmental status of children is highly determined by the social, economic, environmental, and cultural conditions to which the child is exposed. As a result, around the world, developmental status among children is highly variable, and disparities between and within regions are great. Globally, public health practitioners and pediatricians have become committed to finding ways

to ensure that children not only survive physically but also thrive developmentally, emotionally, socially, and spiritually—as whole, thoroughly healthy human beings.[5] Increasingly, health professionals are forming alliances with partners in educational, social service, and governmental sectors to sponsor programs in early childhood development.

In this chapter, we describe emerging global approaches to early childhood development and offer our experience in Chile as an example of early childhood programming in a middle-income Latin American country, analyzing factors that contributed to the success of early childhood policies, including the advocacy role of pediatricians and other key actors.

The Early Childhood Movement in the Developing World

In 2007, *The Lancet* published a series of articles on child development in developing countries that served as a call to public health practitioners worldwide to move beyond a single focus on child survival to a more inclusive child health agenda that included child development.[6] In addition to estimating that 200 million children younger than 5 years in low- and middle-income countries are not reaching their full developmental potential, the International Child Development Steering Group summarized evidence on risk and protective factors for healthy development and conducted a systematic review of randomized, controlled trials of interventions to promote child development that were conducted in the developing world—Bangladesh, China, India, South Africa, and elsewhere.

In 2008, WHO highlighted early childhood development in its landmark report on social determinants of health. In 2011, the International Child Development Steering Group updated its *Lancet* review to identify effective strategies for the reduction of inequalities and improvement of child development outcomes.[7] Among the 10 effectiveness studies and 5 program assessments reviewed, all had substantial positive effects on child cognitive or social-emotional development, parent knowledge, home stimulation, and learning activities with children. All 15 interventions had defined curricula or key messages that were delivered through a variety of mechanisms, including home visits, primary health care visits, nutrition support services, group sessions with caregivers, or combinations of these. Seven interventions worked primarily with parents or caregivers, and 8 worked with parents or caregivers and children together.

Interventions that included parent and child programs had larger effects (median 0.46, range 0.04–0.97) than parent-only programs (0.12, 0.03–0.34).

In some cases, effects were greater for younger children compared with older children and for poorer children compared with richer children. Effects by some information-based, parent-only interventions were small. The authors concluded that the most effective programs are those with systematic training methods for workers, a structured and evidence-based curriculum, and opportunities for parental practice with children with feedback.[7]

Figure 26-1 summarizes a variety of approaches that policy makers, educators, and public health and pediatric providers have tested.[8]

The Chilean Case

Chile is a middle-income Latin American nation with more than 17 million inhabitants and a gross domestic product per capita of US $12,431 in 2010. The extraordinary economic growth of the past several decades has greatly benefited the health of children. Chile has made significant investment in public health and health interventions. Since the 1950s, visionary Chilean public health professionals and pediatricians have played key roles in advancing the goal of reducing infant and child mortality. Jorge Rosselot Vicuña, Francisco Mardones Restat, Fernando Mönkeberg, and Julio Meneghello designed maternal and child health policy to progressively affect morbidity and nutrition. Their plans were implemented throughout the nation, and Chile witnessed a dramatic reduction in infant mortality from 132.6 per 1,000 live births in the 1950s to 8.9 per 1,000 in 2000. Moreover, a highly functional public primary care network with nationwide coverage was developed and structured around the mother-child dyad.

The pioneering child health advocates succeeded in putting children's issues on the public agenda and sustained their policies over time. This was all the more remarkable in that these health advances occurred during turbulent political times and across multiple changes in government. Jorge Jimenez de la Jara, a pediatrician and former health minister, masterfully recounts the advocacy process that accomplished so much for the health of children in his book, *Angelitos Salvados* (The Saved Angels).[9,10] Juan Pablo Beca, MD, and Jaime Burrows, MD, recount the clinical advocacy in Chapter 22 in this volume.

Adding Child Developmental Attainment to Local and Global Aspirations

From 2000 to 2004, as the Pan American Health Organization and WHO began to make strategic alliances with leaders of pediatrics in Latin America

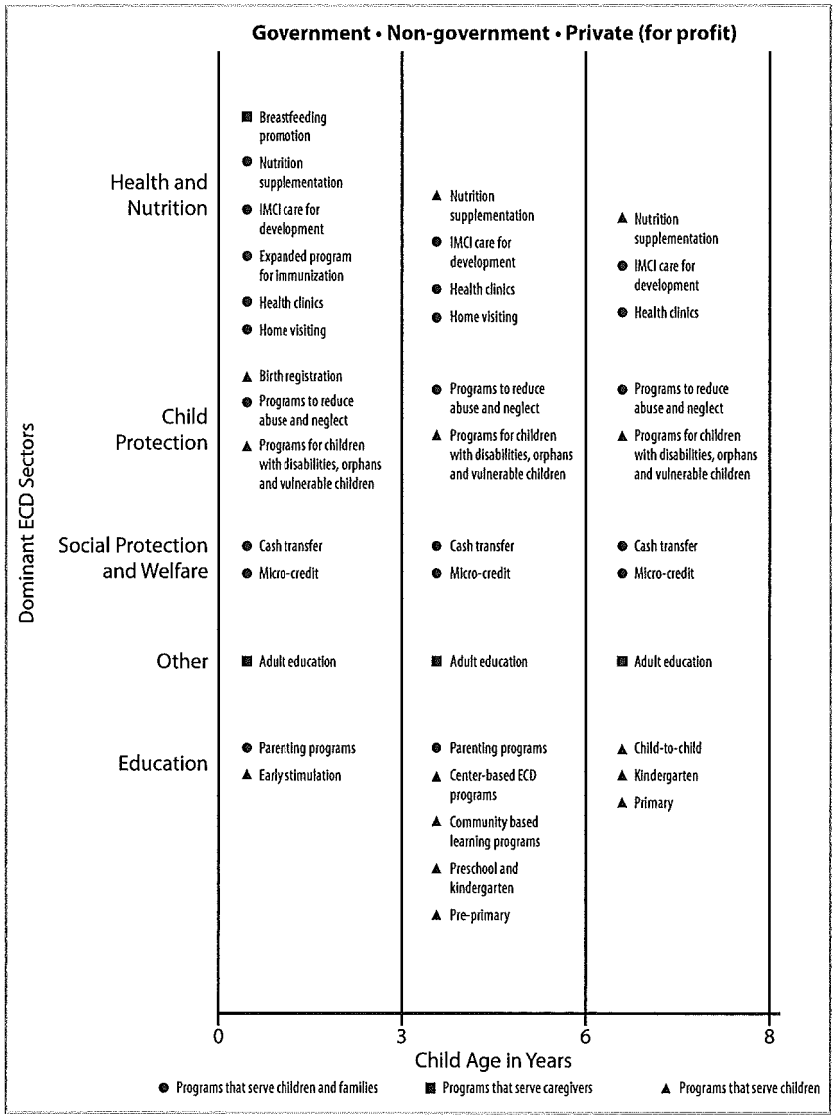

Figure 26-1. Effective strategies for reducing inequalities and improving child development outcomes. Source: Britto PR, Boller P, Yoshikawa H. Quality of early childhood development programs in global contexts: rationale for investment, conceptual framework and implications for equity. *Soc Policy Rep.* 2011;25(2):1–24. http://mathematica-mpr.com/publications/pdfs/earlychildhood/ECD_Global.pdf. Accessed May 13, 2013.

and the American Academy of Pediatrics, the topic of child development began to achieve a level of prominence. During regional events, the group carried out systematic reviews of child development literature, developed conceptual frameworks, and created a shared strategy. The child development movement grew with involvement of national scientific societies. The Latin American Association of Pediatric Societies provided spaces to discuss child development to sensitize and train pediatricians. The Chilean Society of Pediatrics strengthened the notion of integrality in pediatric care and the role given to pediatricians and parents in optimizing the developmental trajectory of boys and girls.

The Measurement of Child Development as an Advocacy Tool for Children

The need to measure child development emerged as a priority in Chile, out of the education sector. While there had been enormous strides in health, there were serious concerns that children's development had stood still. In 2000, the United Nations Educational, Scientific and Cultural Organization reported that education results in Chile were poor and gaps between the rich and poor groups were alarming.[11] For the health sector at the time, while the development issue was relevant, the absence of national data on child development made it difficult to argue about the importance of the topic and advocate for resources to address it.

In 2005, when the Ministry of Health began designing the Second National Survey of Health-Related Quality of Life, a group of researchers at the Catholic University, in collaboration with the Inter-American Development Bank, proposed to expand the first survey's child module (which focused on chronic diseases in children younger than 15 years) to integrate questions about child care and parent-reported development of children aged 3 months to 5 years. The objective of this module was to estimate the magnitude of developmental problems so that the information could be used for advocacy as well as informing the design and monitoring of early childhood policies.

The Ministry of Health granted the request, and investigators created and validated a development measurement instrument[12,13] that asks 6 to 8 questions about developmental achievement by age ranges. Its application is simple and low cost, allowing its incorporation in household surveys that collect large amounts of information.

In 2006, the instrument was applied with a nationally representative sample of 6,210 households as part of the Second National Survey of Health-Related Quality of Life. For the first time, the level of developmental deficiency and delay among Chilean children between 6 months and 5 years of age could be accurately estimated and disaggregated by sex, region, and socioeconomic situation.[14]

The national survey showed that 30% of Chilean children younger than 5 years did not reach all of their expected developmental milestones.[14] Rates of developmental risk are higher among the poorest quintile of the population (Figure 26-2). In Chile, 21.5% of children (570,000) live in poverty, compared with 14.5% of the total population.

Accurate estimates of children's developmental risk proved crucial in 2007 when the Chilean government decided to institute an integrated early child policy, Chile Grows with You (Chile Crece Contigo) (ChCC), and again in 2011 to delineate one of the health objectives of Decade 2011–2020: reduce by 15% the developmental lag in children younger than 5 years in Chile.[15]

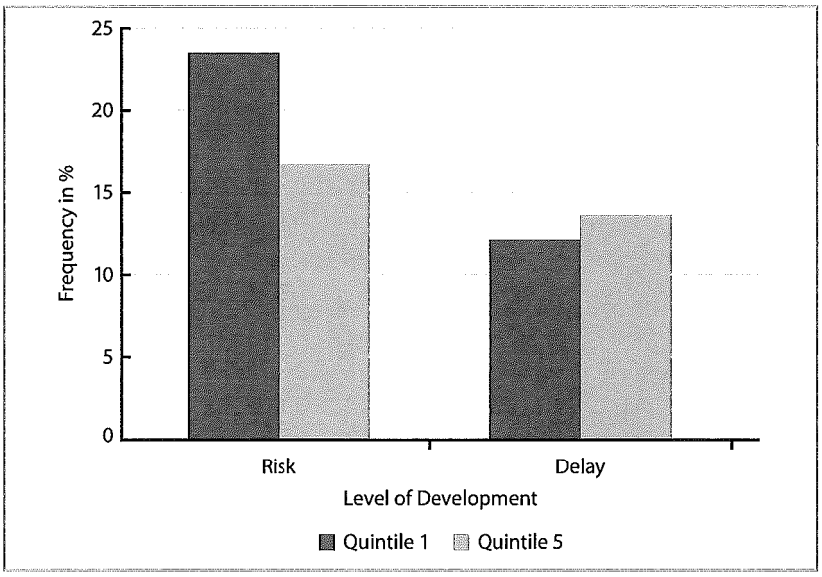

Figure 26-2. Prevalence of developmental risk and delays in a nationally representative sample of children between 1 and 5 years old, Chile 2006. Comparison of quintiles 1 (poorest) and 5 (richest) of socioeconomic status.

The Birth of Chile Grows with You

In 2006, Michelle Bachelet, a pediatrician, became the first female president of Chile. On assuming office, she established early childhood development as one of the top policy priorities of her government. She created the Presidential Advisory Board for Early Childhood Policy Reform composed of 14 people, including 3 pediatricians (Paula Bedregal, Helia Molina, and Concha, former health minister) and a wide range of professionals from across the political spectrum. She charged the advisory board with preparing an integrated child policy focused on early childhood development under the social protection system. The aim was to ensure all children's optimal development, whatever their social origin, gender, place of birth, or family situation, thereby breaking the intergenerational cycle of poverty and reducing inequity in Chile.

Based on recommendations from the advisory board, President Bachelet committed to protecting and promoting children's development from birth. Together with the team at the Ministry of Health, she conceived of a rights-based program that would ensure that young children had access to high-quality health and developmental services, first by taking advantage of every encounter that families had with health professionals, and second by coordinating services for young children across public service sectors. The resulting cross-sectoral system of integrated support services, ChCC, coordinates activities across 9 ministries, from the prenatal period through 4 years, 11 months of age.

Chile Grows with You offers a defined set of universal interventions for all Chileans that are intended to create the proper environment for healthy development, including mass education programs through television and radio programs, a Web site, and the promotion of development-friendly legislative initiatives around maternity/paternity leave and adoption. For all families who receive their health care through the free public health system (approximately 85% of Chileans), ChCC provides free routine well-child care, anticipatory guidance, and biopsychosocial support.

Chile Grows with You offers additional targeted supports for families with fewer resources or greater risk (including home visits, financial support, free nurseries and preschool, preferential access to public programs, comprehensive care, and technical aids for children with developmental delay or disability) (Figure 26-3).

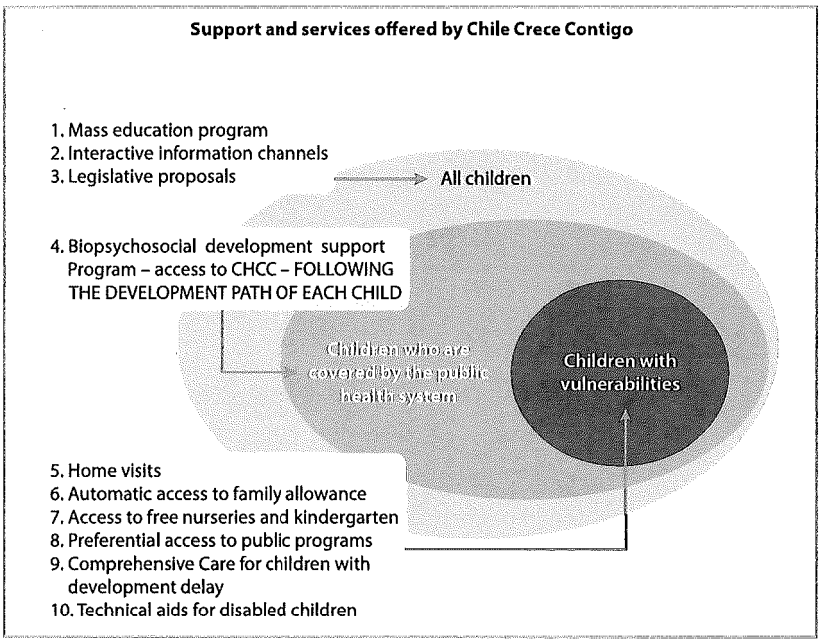

Figure 26-3. Support and services offered by Chile Grows With You (Chile Crece Contigo).

Services begin when families present for the first prenatal visit and enroll in ChCC and continue through the child's fifth birthday. Pregnant women learn the importance of good nutrition and maintenance of healthy habits (eg, refraining from tobacco, drugs, and alcohol). They learn relaxation techniques and how to anticipate the changes that a young baby will bring in their life. Once the baby is born, ChCC supports families in fully welcoming their new baby with joy and a full appreciation of the growth in physical, cognitive, and emotional abilities. Chile Grows with You materials include videos and music CDs and other appropriate child development tools.

The optimal execution of ChCC policy and opportune delivery of ChCC services require coordination, articulation, and strengthening of cross-sectoral integration structures at the municipal, provincial, regional, and national levels. To achieve this, each municipality has created a municipal ChCC network to coordinate all of the public and private institutional, human, and financial resources. After an initial period of local evaluation and review of existing services, these municipal networks elaborate work plans to generate inter-sectoral coordination and a plan for accessing and investing nationally available resources. The networks ultimately have

functioned as referral mechanisms, connecting children and families with available services, as well as creating opportunities for community engagement in themes of early childhood.

Municipal networks are supported by the preexisting provincial coordinator for social protection, a ChCC manager within the National Health Service, and regional heads of ChCC from the regional offices of each participating ministry (Health, Education, Planning). At the national level, the Minister of Planning chairs a committee of ministers, with participation of the ministers of Health, Education, Work, Justice, Housing and Urbanization, Finance, Women, and Secretary General of the Presidency. This national, regional, and provincial organizational structure provides support, technical assistance, and financing to local municipalities to support optimal implementation of ChCC.

The leadership of President Bachelet and the trajectories of the professionals involved in the advisory board gave credibility and power to the initial proposal for an integrated system of services to protect and support early childhood development. Implementation began in 2007, and ChCC was scaled up to the entire country by the end of 2008. In 2009, congress passed legislation that ratified ChCC into law; CHCC is now a right and the state must guarantee all the interventions for children from 0 to 4 years. By 2009, 345 of Chile's 346 municipalities were participating in ChCC. That year, 204,935 mothers were enrolled during their pregnancies and more than 800,000 babies from birth to 4 received ChCC services.[16] Evaluation of the program implementation, users' satisfaction, results, and impact is ongoing.

Support for Child Development Through High-quality Early Education: The Birth of Un Buen Comienzo

In parallel with the creation of ChCC for children 0 to 4 years of age, President Bachelet committed to increasing the number of nurseries, child care centers, and preschools for the poorest 40% of the population. The Bachelet government made the strategic decision to begin providing early education for 4- to 6-year-olds through the public schools. Many policy makers, public officials, and families raised questions about whether the government could expand early childhood and at the same time maintain a high standard of quality. Would there be adequately trained staff, knowledgeable in child development and early childhood education? How well would schools articulate with the health system? How would the public know if children were indeed benefitting from early education in schools?

Policy makers from the ministries of Education and Planning who were interested in advancing the quality of expanded early educational services reached out to colleagues in the United States and Australia for advice. Steve Reifenberg, then director of the Santiago office of the David Rockefeller Center for Latin American Studies of Harvard University (DRCLAS), was aware of the Chilean government's interest in expanding and improving early childhood education. In 2006, DRCLAS sponsored a large meeting at the Catholic University including Chilean and American child development and public policy experts.

The Catholic University meeting led to the convening of a Mesa Técnica Interinstitucional composed of Harvard faculty, Chilean policy makers and leaders in early childhood, representatives of 3 major organizations that provide early childhood care and education (Junta Nacional de Jardines Infantiles, Integra, and Hogar de Cristo), and local stakeholders from one municipality (municipal administrators, school principals, preschool teachers). Over 18 months, the Mesa Técnica Interinstitucional worked to craft a meaningful endeavor to promote quality in the early education expansion process. With the clear intention of complementing the emerging ChCC, the Mesa specified the goal of a new program, Un Buen Comienzo (UBC): to support children's healthy development by improving the quality of early educational experiences and coordinating health services for 4- to 6-year-olds enrolled in the public school system.

Modeled roughly on Project Head Start in the United States and a successful teacher training program in Costa Rica (Amigos del Aprendizaje),[17] UBC provides public school prekindergarten and kindergarten teachers and aides with 2 years of training and in-classroom coaching in the following 4 domains:

1. *Oral language and early literacy.* Training included book-reading strategies, using extended discourse, and developing children's vocabulary and emergent writing skills.
2. *Coordination of early childhood education with health services.* Teachers were equipped with skills and materials to address health problems affecting young children in Chile, including respiratory illnesses and lack of well-child visits.
3. *Socio-emotional development.* Training focused on behavior management strategies, establishing a positive classroom climate, and individual case management.
4. *Family involvement.* Training involved strategies to get parents involved in their children's learning.

Un Buen Comienzo professional development is delivered through 12 modules (6 per year) with 4 weekly activities: a didactic workshop to introduce a topic and corresponding instructional strategies. Coaches provide in-classroom sessions and reflection opportunities for teachers. After pilot testing in 5 schools in Santiago in 2007, the intervention was revised and implemented in 64 high-need schools in 6 municipalities of Santiago from 2008 to 2011.

Schools within participating municipalities were randomized to UBC intervention (2-year intensive teacher training plus 100 books per classroom) or a comparison condition, which consisted of 10 books per classroom and one workshop on self-care for teachers and aides. Results from a cluster-randomized evaluation show that UBC has had statistically significant, moderately sized positive effects on 2 of 4 indicators of classroom quality—emotional support and classroom organization. The UBC intervention has substantially improved teachers' abilities to support children's social and emotional functioning and to organize and manage children's behavior, time, and attention in the classroom, with more time spent in meaningful language exchange, better social interactions among the children, and fewer disruptive behaviors. The full impact evaluation results will be available within the next several years, while longer-term effects require longitudinal assessment.

Together, ChCC and UBC have opened the door to a serious exploration in Chile of the essential elements to ensure that young children develop to their full potential and have increased opportunities to grow into productive citizens as their country grows in its overall maturity, prosperity, and international prominence and responsibility.

References

1. World Health Organization. Constitution of the World Health Organization. http://www.who.int/governance/eb/who_constitution_en.pdf. Accessed May 13, 2013
2. Couperus JW, Nelson CA. Early brain development and plasticity. In: McCartney K, Phillips D, eds. *The Blackwell Handbook of Early Childhood Development.* Malden, MA: Blackwell Publishing; 2006:85–105. http://onlinelibrary.wiley.com/book/10.1002/9780470757703. Accessed May 13, 2013
3. National Research Council, Institute of Medicine. *From Neurons to Neighborhoods: The Science of Early Childhood Development.* Washington, DC: National Academies Press; 2000

4. Garner AS, Shonkoff JP; American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health. *Pediatrics.* 2012;129(1):e224–e231
5. Molina H, Cordero M, Silva V. De la sobrevida al desarrollo integral en la infancia. *Rev Chil de Pediatr.* 2008;79:11–17
6. Engle PL, Black MM, Behrman JR, et al. Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *Lancet.* 2007;369(9557):229–242
7. Engle PL, Fernald LC, Alderman H, et al. Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet.* 2011;378(9799):1339–1353
8. Britto PR, Boller P, Yoshikawa H. Quality of early childhood development programs in global contexts: rationale for investment, conceptual framework and implications for equity. *Soc Policy Rep.* 2011;25(2):1–24. http://mathematica-mpr.com/publications/pdfs/earlychildhood/ECD_Global.pdf. Accessed May 13, 2013
9. Jimenez de la Jara J. *Angelitos Salvados.* Santiago, Chile: Uqbar Editors; 2009:166–170
10. Jiménez J, Romero MI. Reducing infant mortality in Chile: success in two phases. *Health Aff (Millwood).* 2007;26(2):458–465
11. International Office of Education, United Nations Educational, Scientific and Cultural Organization. *La educación Chilena en el cambio de siglo: políticas, resultados y desafíos. Informe Nacional de Chile.* Santiago, Chile: Ministerio de Educación; 2004. http://www.ibe.unesco.org/International/ICE47/English/Natreps/reports/chile_part_1.pdf. Accessed May 13, 2013
12. Bedregal P, Scharager J, Breinbahuer C, Solari J, Molina H. Validación de un instrumento de tamizaje de población para evaluar rezagos del desarrollo en población chilena de 0 a 6 años. *Revista Médica de Chile.* 2007;135:403–405
13. Bedregal P, Hernández V, Yeomans H, Molina H. Validez concurrente de una prueba de tamiz poblacional para niños entre 6 y 59 meses de edad. Congreso Latinoamericano ALAPE, 2012
14. Segunda Encuesta Calidad de Vida, Ministerio de Salud, Gobierno de Chile, 2006
15. Ministerio de Salud de Chile. ESTRATEGIA NACIONAL DE SALUD Para el cumplimiento de los Objetivos Sanitarios de la Década. 2011-2020. http://www.minsal.gob.cl/portal/url/item/b89e911085a830ace0400101650115af.pdf. Accessed May 13, 2013
16. Molina H, Silva V. Four years growing together: memories from the early childhood protection system 2006–2010. Ministry of Health Chile. 2010. http://www.oei.es/inicialbbva/programas_infancia/Chile.pdf. Accessed May 31, 2013
17. Rolla San Francisco A, Carlo M, August D, Snow CE. The role of language or literary instruction and volcabulary in the English phonological awareness of Spanish-English bilingual children. *Appl Psycholinguistics.* 2006;229–246