Abstract
Preference for mother and child social protection is a constant in public policies all around the world. Most of the basic strategies are known and have been described, proven on its efficacy and cost-effectiveness several times in different settings in the last 100 years. But from knowledge to action and from action to impact, there has been a variable and dramatic gap which can be mended with other policy tools. Beyond technical considerations, conviction, commitment and mystique are in my view and experience those critical factors. The other issue is close relation between academia, policy making, regular politics and public opinion.

Here, I recall personal experience and review mother and child health (MCH) policies in the last 50 or more years in Chile, the country I know best [1–3].

The first registered event on child health policy in Chile took place in 1912. Many interventions with progressive coverage were implemented during decades of improvement in health care policies. The early emphasis on nutrition is quite clear from the start.

With the consolidation of a National Health Service (NHS) in the 1950s, Chile established an MCH policy based on the typical pillars of action: antenatal care, professional attention of deliveries, family planning, nutrition programs, well baby clinics, immunizations, respiratory and gastrointestinal infection therapies and water and sanitation projects in poor communities.

The basic ideas were developed and tested by a group of socially sensitive academics from Universidad de Chile, who went to the community, studied the
sociomedical conditions, proposed and essayed their interventions (1955–1960) and after having the conviction, ‘took power’ by accessing key posts in the NHS (1960–1965).

Impact was visible by the late 1970s, ironically during a period of military dictatorship, neoliberal reforms to the economy and deep recessions. The sociomedical model for child survival proved to be stronger than reality would have predicted.

**Background to Child Survival Policy**

Infant and child health policies have been present in public health for more than two centuries together with maternal health and fertility intervention models. Together with infectious disease control, they are the main highlights of public policy, social priority and political platforms in every country regardless of the level of their development.

Reviewing history in Western countries we find all sorts of initiatives that reveal a universal motivation to save children’s lives. From charity to legislation with pro-poor and pro-children protection laws and governmental provisions; together with industry production of effective food for babies and global agencies maternal and child health policy formulations [4–6].

In my opinion, one of the best packaged policy formulations of child survival policy was GOBI, declared by UNICEF in the 1970s. G standing for growth and nutrition, O for oral rehydration in diarrheas, B for birth spacing and fertility regulation, and I for immunizations [7].

Later in the 21st century, one lucid conceptualization of infant and child survival awareness was the series of papers and policy convocations done by the Bellagio Group on Child Survival (2003) and published in *The Lancet*. In these publications of expert opinions, the main ideas were:

- Unacceptable high number of children are dying every year, 10 million
- Malnutrition is present in about 40% of cases
- We have cost-effective tools to prevent and treat the majority of negative conditions

We can see that the information has been there for a long time, many scholastic interpretations and theories have flourished, including the last one called Social Determinants of Health (UNICEF/Experts consultation 22–23 June 2012), but still too many children die at early stages of life with avoidable causes and the quality of life of these children is rather poor. This therefore is, as it always has been, a moral issue.
Describing and reflecting on country-level experience is critical to correctly apply and establish solutions for survival and quality of life for children. Of course, there are many contextual conditions that restrict generalizations and simplistic attempts to teach or learn from others’ experiences, and I will try to avoid that trap.

Between a National Conference on Infant Protection in 1912, headed by the President of the Republic, to the first explicit formulations of country policy documents in the 1960s and 1970s, several events occurred. Private charities appeared, public institutions were created, important research took place and several interventions were field tested by academics working in coordination with the health services network and planning centers. A chronological list is presented in table 1.

**Formation and Influence of Leading Academics**

Looking back and examining in more detail how things happened and which were the motivations for these developments, I found a group, not isolated but emblematic, that did things well, Prof. Meneghillo’s group. By mid-1950s, in the midst of creating the NHS with its ability to integrate different strengths from diverse sources, they established themselves as academics with a social mission.

Among other documents, they had a ‘research manifesto’ with some statements like: ‘We shall put more interest in important than rare matters, in persons than in cases. As much interest in health as in disease, in prevention as in cure, in parents and families as in the child.’

In 1958, the main items in their research agenda, very much oriented to action, were the following, transcribed literally:

- Biodemographics of the district in charge
- Morbidity registration
- Evaluation of children’s nutrition
- Evaluation of psychomotor development
- Longitudinal study of physical, biochemical and emotional states in different stages of development
- Useful research to define feeding models for children
- Evaluation of therapeutic norms in ambulatory care in its efficacy and cost
- Immunological studies to test the efficacy of vaccines in use
- In-depth analysis of sociodemographic, housing, cultural and environmental conditions of families
**Table 1.** Chronological list of developments, interventions and events related to health care in Chile

<table>
<thead>
<tr>
<th>Time period</th>
<th>Institutional development, intervention, event</th>
<th>Infant mortality range, deaths per 1,000 LB</th>
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</thead>
</table>
| 1900–1920         | Goutte de Lait (1902)  
National Infant Protection Conference (1912)                                                              | 300–247                                    |
| 1921–1940         | Ministry of Health (1924)  
Mother and Child Health Law (1937)  
First National Council for Nutrition and Food (1937)  
First powdered milk factory in alliance with private industry and expansion of supplementary food programs (1937) | 258–192                                    |
| 1941–1960         | Agency for Infancy Protection (PROTINFA, 1942)  
NHS (1952) with integration of social security and medical and sanitary services  
Massive immunization and eradication of smallpox (1950–1954)  
Social Pediatrics Departments created by Universidad de Chile (1948–1954)  
| 1961–1990         | National Diarrhea Program is established (1964)  
Measles vaccine introduced in progressive universal coverage (1963)  
Universal access to  
– supplementary food programs (1965–1975)  
– contraceptives and family planning services (1965)  
Midwife formation by Universidad de Chile reaches effective numbers (1970)  
Deliveries reach 98% professional care (1980)  
Water and sanitation reach 97 and 78% coverage  
Malnutrition rates fall from 37% of children under 6 years to 2.9% (2000)  
Average years of schooling for young women reaches 12 years | 106–16                                      |
Universal access interventions established in  
– Consolidation of neonatal program  
– Expansion of vaccine program: HiB, MMR, 2nd dose of measles  
– National acute respiratory infections program  
– Congenital cardiac defects diagnosis and surgery  
Eradication of measles (1992)  
Fall in infant mortality rate due to pneumonia from 239 per 100,000 (1990) to 76 (2000)  
Health reform: Guarantee Program (2005)  
High-school and university students start massive protest for better education: demographic transition takes place | 16–8                                       |
• Evaluation of the effect of sanitary education campaigns
• Execution of an effective antenatal control program and an obstetrical service that allows optimal and integral prenatal, newborn and postpartum care
• Comparative evaluation of present procedures in order to measure the performance of an MCH program and innovations suggested as experimental

One can see that this list of research and action should be presented as pertaining to the year 2013, and very few would discover that they are 55 years old and still valid.

I met these persons during my medical studies in the 1960s and was fascinated by their spirit, clearness of mind, commitment to do good and be part of a mystical project. They inspired people, inspired my own life.

At the beginning of 1960, a subgroup of more policy-motivated experts of these academics enrolled themselves in the NHS technical units via public opposition and started their escalation of programs in MCH strategies. With a high profile of conviction and consensus with other specialists and national politicians, their local models progressively became national. The country was living a time of social reform and search for ways to escape poverty and underdevelopment. In my international experience, perhaps the Finnish group of Pekka Pushka may parallel a similar access to political power for public health improvement purposes. The important lesson is: don’t wait for the mountain to move towards you, go for it [pers. commun., 1998].

Continuing their career, these experts moved in the 1070s to the Pan American Health Organization (PAHO/WHO) and more or less repeated the same process with renowned success [8].

**Impact of Policy**

Results of infant mortality decline between 1950 through 2000 are shown in table 2.

**Nutrition Policies over Time**

As stated before, malnutrition of children is one of the most cited factors in infant mortality documents regarding diagnosis and strategies in the Chilean literature. The adoption of the private model of Goutte de Lait (milk drop) with fluid milk donation and later with well baby clinics was established in the country by pious ladies as a charity in 1903. In 1924, the Workers Insurance Institute (Caja de Seguro Obrero Obligatorio) rapidly adopted care for wives and children.
of laborers ascribed to the scheme with expansions towards the end of the de-
cade. The Mother and Child Law of 1937 was basically a pro-poor food and nu-
trition legislation with agreements between government, farmers producing
milk and private industry putting technology for powdered and condensed milk
production locally. Negotiations headed by the Minister of Health, a brilliant
physician and inspired politician, took only a few months and the society ad-
opted the strategy as its own.

By the mid-1940s, the difference between those protected by social insurance
and the poor indigent families became evident, and a movement towards re-
forms headed by pediatricians and sensible politicians started in the country.
Evidence was published and proclaimed by socially sensitive pediatricians with
political connections.

The integration of different scattered services and social security medical
units into an NHS became law in 1952 and progressively developed its algo-
rithms for interventions mainly in MCH with a strong emphasis on nutrition
programs.

The key set of interventions were the well baby control and included pow-
dered milk donation, immunizations, basic therapy for infections (respiratory
and intestinal) and maternal education.

In figure 1, it can be seen that there is a strong correlation between medical
visits and the amount of milk distributed.

<table>
<thead>
<tr>
<th>Table 2. Infant mortality rate by selected causes, rates per 1,000 LB, Chile 1950–2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB number</td>
</tr>
<tr>
<td>Infant mortality rate</td>
</tr>
<tr>
<td>Neonatal mortality rate</td>
</tr>
<tr>
<td>Postneonatal mortality rate</td>
</tr>
<tr>
<td>Certain conditions originating in the perinatal period</td>
</tr>
<tr>
<td>Pneumonia and bronchopneumonia</td>
</tr>
<tr>
<td>Diarrhea and gastroenteritis of presumed infectious origin</td>
</tr>
<tr>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
</tr>
<tr>
<td>Selected infectious diseases: vaccination preventable, congenital syphilis and meningococcal infections</td>
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</tbody>
</table>

Author’s analysis of data provided by the National Statistics Institute and the Ministry of Health, Chile.
The impact of this nutrition policy, embedded into an integrated delivery of social services based on the Primary Health Care network of the Chilean NHS covering a high percentage of the territory and population was visible by the decade of 1970, and child malnutrition disappeared almost totally by the end of the century (table 3).

As we are now confronting the obesity epidemic, we may discuss the plausibility of these powdered milk donations linked with well baby care in the primary health care setting. The ‘hook’ is comparable to what now is called ‘conditioned cash transfers’ promoted by development agencies in child survival programs. But it is clear for me that the ensemble was a virtuous one.

**Mortality Declines but Components Change: The Second Phase**

By 1990, 40 years after the creation of the NHS, infant mortality had fallen to 16 per 1,000 live births (LB), a reduction of 88%. The main components were perinatal conditions with 5.5 per 1,000 LB (35%), congenital malformations with a

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**Table 3. Percentage of malnourished children under 6 years of age, Chile 1960–2000 [9]**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total malnutrition</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>37.0</td>
<td>31.1</td>
<td>4.1</td>
<td>1.8</td>
</tr>
<tr>
<td>1970</td>
<td>19.3</td>
<td>15.8</td>
<td>2.5</td>
<td>1.0</td>
</tr>
<tr>
<td>1980</td>
<td>11.5</td>
<td>10.0</td>
<td>1.4</td>
<td>0.2</td>
</tr>
<tr>
<td>1990</td>
<td>8.0</td>
<td>7.7</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>2000</td>
<td>2.9</td>
<td>2.6</td>
<td>0.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>
rate of 3.7 (23%), and respiratory infections with 2.4 per 1,000 (16%). The neo-
natal component had surpassed the postneonatal fraction in a few years. This
decline occurred in Chile in a period in which several recessions, hyperinflation
and unemployment took place. In fact, the good evolution of infant and child
survival proved to be independent of economic cycles. Nevertheless, towards
1990, the country was still only partly developed and had 40% of its population
living under the poverty line, and faced a new challenge to its child health policy.
Together with the restoration of democracy in 1990, the new government had
to reinforce the social medicine and public health tradition of the country and
express its commitment to improve equity in health.

Main interventions via specific programs were:
• Improved perinatal care via better technology and low birthweight prevention
• Treatment at primary health care of the acute respiratory infections, with
  innovative approaches
• Surgical correction of congenital heart disease
• Further expansion of the immunization program (measles second dose,
  HiB conjugate vaccine)

Results of the Second Phase Strategy

Infant mortality fell from 16 per 1,000 LB in 1990 to 8.9 in 2000. The biggest re-
ductions were in: acute respiratory infections, from a rate of 2.4 to 0.66 per 1,000
LB; perinatal conditions, from 5.5 to 3.4 deaths per 1,000 LB, and congenital
malformations, from 3.7 to 3.0 deaths per 1,000 LB (19% reduction; table 4).
With the surgical program, mortality due to cardiac congenital conditions de-
creased from 1.24 to 0.82 per 1,000 LB (34% reduction). The total infant mortal-
ity rate of 8.9 had a totally changed composition, with almost two thirds (5.6)
due to neonatal mortality and one third postneonatal (table 4). The total public
health budget of Chile for 2000 was equivalent to USD 2.28 billion. The expen-
diture on these four innovative programs was USD 16.75 million, a minute frac-
tion of the total. If we calculate that 285 additional children are surviving every
year, each death averted costs near USD 58,771.

Lessons and Reflections

In my opinion, the main lessons behind this success story, from the public health
point of view, were: (a) an integrated vision of health and life cycle with the envi-
riment, with a preference for health care in ambulatory and community settings;
(b) an integrated conception of health care and health organizations, in which every action is part of a holistic strategy; (c) a multidisciplinary health care team with several professions combining higher to lower skills with substitution of functions; (d) research and training in action through integration of public health services within university departments; (e) continuing evaluation of programs and instruments, and (f) permanent improvement of quality and reliability of epidemiological data, including medical certificate of cause of death and audit of infant deaths.

Integration is a key word and concept; it has to do with closeness between research and action, government and academia, public and private sectors; it is possible and necessary. If academics do not have power, they must look for it. The role of the private sector must be clearly defined and promoted beyond preconceived ideological positions in a pragmatic way.

The integrated conception of life and health is crucial; we always have to keep in mind that health is the consequence of multiple, especially social, factors and we must intervene on them from the societal level and by the provision of services. The link between health and nutrition is obvious.

The integration of care and different skills has proven to be critical in the expansion of health services. We are reinventing the wheel today with apparent innovative calls to build integrated services over the successful vertical programs such as HIV and tuberculosis (some people have very little memory).

Institutional arrangements to promote space for consensus are critical. National Councils or Boards such as the ones being used in several countries for vaccine and immunization policy are a good example of how different players can develop their part in a productive way.

Gender issue is also relevant for the construction of policy and creation of effective human resource networks. The role of women, again nothing new, is more than relevant in this objective.
The result of the child survival revolution takes us to a different and even more challenging stage: the demographic transition and the quality of life in early development. This is the situation we are facing today in Chile, with millions of teenagers demanding better education and training.

In summary, Chile shows a particular blend of applied research, close link between policy making and academia, field testing in local conditions, and above all, strong commitment with social policies for the society as a whole.

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References