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Chile's school feeding programme: targeting experience

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Abstract

The Chilean School Feeding Programme's (SFP) main objective is to provide social and food assistance to low income children attending public schools. It targets 1,2 million children daily with meals provided by local food companies. These have different caloric content, depending on the child's age and the school's vulnerability index, which is indirectly related with the poverty level of its students and determined yearly by a targeting model. There are two models, one for children in primary and the other for those in secondary schools, both based on variables gathered from first and ninth graders respectively and determined by a logistic regression analysis. This methodology provides a vulnerability index per school which allows these to be ranked; a cut-off (established by available fiscal budget) determines the type and amount of meals received by the school. The decision of who receives the meal inside the school is determined by a committee. Presently coverage amounts to 40% of all primary schoolchildren in public schools. Evaluations of the targeting models have shown that targeting has improved over time; 80% of total SFP funding for primary schools is concentrated on the two lowest income quintiles, while at the secondary level, it only targets around 21% of potential beneficiaries, because coverage is much lower. Because the SFP provides a significant proportion of the daily energy needs, it has shown to be an excellent incentive for poor parents to send their children to school. © 2002 Elsevier Science Inc. All rights reserved.

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1. Introduction

In Chile, large scale food intervention programmes have a long history. Of these, the School Feeding Programme (SFP), although not the one with the widest coverage has the

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Table 1
Coverage of the School Feeding Programme (2000)

Type of Beneficiaries	Caloric Content of the daily meals (Kcal)	Number of meals per day
Primary Schools	700	589,496
	1000	236,040
	250	10,161
Secondary Schools	350	41,390
	650	156,847
Student's Homes		
For boys	2400	6,300
For girls	2100	700
Pre school children	650–1000*	30,074

* Depends on the child's age.

Source: National Board for School Assistance 2000

biggest fiscal annual budget, around US\$ 145 million. In this paper we will describe the SFP's main characteristics, the present targeting criterion, results from some adequacy evaluations and finally give general conclusions which might be useful for programme planners.

The SFP is administered by the National Board of School Assistance and Scholarships (Junta Nacional de Auxilio Escolar y Becas or NBSA), which depends on the Ministry of Education. Its main objective is to provide social and food assistance to low income children attending state-supported schools. The main goal of the SFP is to promote school attendance by providing free meals to those children who might otherwise drop out from school; those children are in fact the most impoverished ones. The meals have different nutritional contents and are distributed during approximately 180 days per year [1].

Presently approximately 1,2 million children are served daily by the SFP. These children attend 9500 schools. Of these, 7300 are primary and 900 are secondary schools, 1,133 are kindergartens. The remaining are students (generally from out-of town) who live in special houses. Table 1 shows the distribution of daily meals according to their energy content and the type of beneficiaries receiving them.

The primary or secondary schoolchildren of the same school receive only one type of meal. For the primary schoolchildren, the energy content of the meals contains either 1000, 700 or 250 Kcal/day. The 1000 and 700 Kcal/day meal consists of breakfast plus lunch or lunch plus an afternoon snack; the 250 Kcal/day meal, only breakfast. For children in secondary level, 650 or 350 Kcal/day are provided as lunch or breakfast alone respectively. The type of meal provided depends on the vulnerability index of the school (related to some social, biomedical and anthropometric variables of the children). The description on how this is calculated will be explained later. SFP also provides 4 meals/day (2400 and 2100 Kcal/day) to children living in boarding institutions. During summer holidays, meals are given out for some special activities such as camps, summer courses, scouts etc. With respect to the nutritional content of the meals provided to preschool children who are in state-run day care centers, these follow an age-criteria and there is no targeting, that is, all the children are beneficiaries [2].

2. School feeding programme: key issues

2.1. Food component

Food assistance at the school level began in Chile in 1929 with the establishment of the “Boards of School Assistance and Scholarships” at the county level. Resource allocation came from the county as well as from the central government. School feeding programmes remained under county control until 1952 when the Ministry of Education decided to administer them centrally. In 1964, NBSA was created and until 1976 it had the direct operational responsibility for the purchase, storage, preparation and distribution of the food [2,3]. This programme design demanded a complex administrative structure of offices, warehouses, transport etc. requiring as much as 40% of SFP’s total budget. Several studies conducted between 1965 and 1976 concluded that the Programme had major deficiencies in its implementation in addition to very high administrative costs [4,5]. As a consequence of this, the provision of the meals was gradually (1976–1980) transferred to the private sector, contracting with private suppliers. This experience proved to be highly positive in terms of the programme’s efficiency and the quality of the food distributed. Contracting out diminished the administrative costs borne by the government, from 40% of the total budget to about 5%. The unit cost of the meal declined in half, to US\$ 0.60 (breakfast or snack plus lunch). Presently NBSA’s role in the SFP is normative and supervisory rather than as a meal provider. It develops the technical norms for the programme, controls the quality of the service provided, the nutritional content of the foods served and defines the targeting criteria [6]. The NBSA is also responsible for the bidding process in which annually, private food companies are selected to provide services to one third of the schools for a 3-year period. These companies are responsible for the entire process, that is, from the purchase of ingredients to the actual distribution. Under this scheme, NBSA only pays for the meals actually served. If the meals are not acceptable to an important proportion of the children, the companies are obliged to make adjustments. Presently, there are 27 companies participating in this process.

The advantages of this system include: a) competition between firms has reduced costs and improved nutritional quality b) NBSA’s administrative costs declined to no more than 5% of its total budget c) programme efficiency increased and d) food acceptability and hygiene also have improved

2.2. Targeting mechanisms

SFP targets at the school level, but only public or state-subsidized schools (around 9500 or 95% of them in the country). The methodology is based on information from individual children in first and nine grades gathered by a census carried out each year. Only those grades are included for targeting the primary and secondary levels respectively, because studies demonstrated [7] that social, economic and nutritional situation of those children represented the reality of the whole school. Not all children in participating schools receive the benefit; the other children have to bring their own food. Since the year 2000, schools (with the

contribution from parents) have the option to purchase from the company that distributes the SFP meals, the same meals for non-beneficiaries and at the same price.

2.2.1. History

In 1985, the Ministry of Planning starting implementing the National Socioeconomic Survey or “CASEN” Survey, which is a nationally representative survey carried out every two years, to determine the impact of public expenditure on the social sector as well as the adequacy of targeting of the main social programmes [8]. Results from the first survey showed that 13% of the children in the upper income quintiles were receiving SFP benefits. This finding was essential in the elaboration of a targeting strategy, which with few changes, is the one used nowadays. The instrument developed was the result of a weighted index of characteristics of the children in first grade analyzed by the principal-components analyses and correlated with, This the key dependent variable, or the teacher’s perception of the child’s need for food. The next step was to have an index by school expressed as a percentile distribution, determined by extrapolating the information obtained from the children in first grade to all the children in primary education. [9]. This information was used to estimate an overall need score for the school and the number of beneficiaries in the school. The schools were then ranked nationally according to these indices; the same methodology was applied across all counties. Based on this ranking, NBSA assigned the number of meals by county; finally each county made the last decision on the total meals per school. It is important to point out that the total amount of meals distributed depends on the budget allocation given by the Ministry of Education [7,10].

This methodology was applied until 1990, when a new statistical approach was selected. The use of logistic regression models to predict a school need for food was then decided. Variables are considered as dichotomic, falling into the “yes” or “no” category. Until 1992, the targeting model was the same for both urban and rural primary schools in the country. The weights of the selected variables slightly change every year depending on the result of the logistic regression analysis from the data of the previous year.

In this period, a School Health Programme was initiated by NBSA because of the concern expressed by teachers who observed that children had major dental and postural problems. School teachers are trained to detect health conditions which may influence academic performance, specifically: dental, hearing, visual and postural problems. The Health Programme covers all children till the 8th grade (approximately 1,650,000) from the 7300 schools that have primary education and are beneficiaries of the SFP. The data collected serve to refer children to the health clinic. In fact, in 1999, 162,000 children were referred for specialized health care. Also, some of these health variables have been included in the present targeting model.

In 1992, a specific SFP was created for secondary education. Targeting for this Programme is based on the census of children in 9th grade (first year of secondary education). Although there is no specific health programme coordinated by the NBSA for secondary level, teachers are trained to detect if children present certain deficiencies. These variables have been included in the model from the beginning, because of their high correlation with poverty.

2.2.2. Present targeting model

The targeting model for both primary and secondary education continues to be based on a logistic regression analysis where the dependent variable still is the “need for food” determined by the classroom teacher for each child. These variables are expressed as the % of children exhibiting a particular deficiency, the “weight” or (β) given by the logistic regression for each expresses the strength of the variable in predicting the school’s need for food.

The “weights” of the variables included in the model can change yearly, depending on the association shown with the dependent variable. At the primary level, only one model exists for urban and rural schools; the difference being that in the case of rural schools, the model only serves to determine the type of meal they receive (1000 or 700 Kcal/day), because all the children are beneficiaries.

The model used in 2000 for primary schools is:

Variables	Weight (β)
– % of rural students vs urban	1.264
– % of students whose mothers have <10 years of schooling	0.036
– % of students who begin primary school with ≥ 8 years	0.014
– % of children with a weight for age < -2 SD WHO	0.012
– % of children with dental caries	0.011
– % of students with hearing problems	0.003

The model finally provides a “vulnerability index” per school; all the schools are then ranked according to this index. Several cut-off points of this index are determined (according to the annual budget) in order to assign the type of meal the school is entitled to. For example in 1999, if a primary school had an index of ≥ 80 (meaning that more than 80% of the children in first grade were classified as “needy”), all the children received 1000 Kcal/day; if this index fell between 20 and 80, they received either 700 or 250 Kcal/day; below 20, very few of them and only 250 Kcal/day.

An analysis carried out by the Catholic University [11] compared the value of the average national vulnerability index as calculated by this model with the same average provided solely by the dependent variable, that is the need for food as determined by the teacher. The results showed that the index gave 57.5% for urban, 97% for rural children with a national average of 70%, compared to the estimated need which gave 64%, 94% and 80.6% respectively. These results show that at the national level, on average, there is a 10% difference between these figures, confirming the association between the calculated index and the “real need”. The 10% difference is due to the fact that not every child classified by the teachers as needy receive the benefit; this depends on the amount of meals given to the school, which in turn is related to its index.

In 1999, total enrollment of primary schoolchildren in state-supported schools was approximately 2.1 million. Of these, practically all of them are included in the school census. The SFP targets 836,000 children, that is around 40%.

For secondary education, the same analytical procedure is applied, but the model is different, and as stated before, is based on information gathered on nine graders. Presently, there is also one model for urban and rural secondary schoolchildren.

The model used in 2000 for secondary schools included:

Variables	Weights (β)
– % of students who repeated a grade in primary school	0.0039
– % of students in need for dental care ^a	0.0117
– % of students whose “parent” is other than father	0.0148
– % of students with mothers have <10 years of schooling	0.0144
– % of students who were beneficiaries of SFP in primary school	0.0224

^a defined as >2 dental caries.

In 1999, the total number of schoolchildren in secondary education in state-supported secondary schools was approximately 671,000 in 1900 schools. Of these, the SFP covers 900 schools with 198,000 students. In 1999, cut offs of the vulnerability index for secondary education were ≥ 50 , 35–50 and <35.

It is important to point out that in Chile, secondary education is not mandatory and the poorest children have less access to it. Regions with the highest vulnerabilities (as calculated by the model) do not necessarily represent those with the greatest proportion of poor people. In fact, it is very likely that in regions with the highest levels of poverty, there is also a smaller proportion of children in secondary education.

2.2.3. Evaluation of targeting models

The CASEN surveys have served to verify if SFP’s targeting model is in fact reaching schoolchildren of poor families.

Figs. 1 and 2 show the results of the distribution of SFP resource allocation, both at the primary as well as at the secondary levels. The data originates from the CASEN surveys conducted from 1985 [12].

Fig. 1 presents this distribution on primary schoolchildren for 1985, 1992 and 1998. The progression is clear, especially when one compares the first and last periods shown. Eighty percent of total resources are concentrated on the first two quintiles; targeting has improved especially for the poorer children. With respect to secondary schoolchildren, Fig. 2 shows that even though targeting of resources has improved considerably, these should concentrate further in the lowest quintile.

Table 2 shows SFP’s coverage (% of population targeted) among primary and secondary schoolchildren by income quintiles in 1998. Total coverage for primary schoolchildren is 40%; as income declines it improves (operating as targeted programmes should). Theoretically there is still room for improvement in the two lowest quintiles. With regard to secondary schoolchildren, the programme only targets 21% of potential beneficiaries, and coverage is very low among the lowest quintiles. The possible explanation given by the experts is that the values of income cut offs to determine quintile distribution among a smaller sample is more spread out. In other words, a child in secondary school might be classified in the fourth quintile and not be a beneficiary, because of the smaller number of meals distributed, while the same child in primary school might have been classified in the second quintile.

The results presented above prompted the NBSA to fund in 1998/99 an evaluation with the objective of determining how well the calculated vulnerability index for both primary and secondary schools correlated with the poverty level of the families of the beneficiaries. This

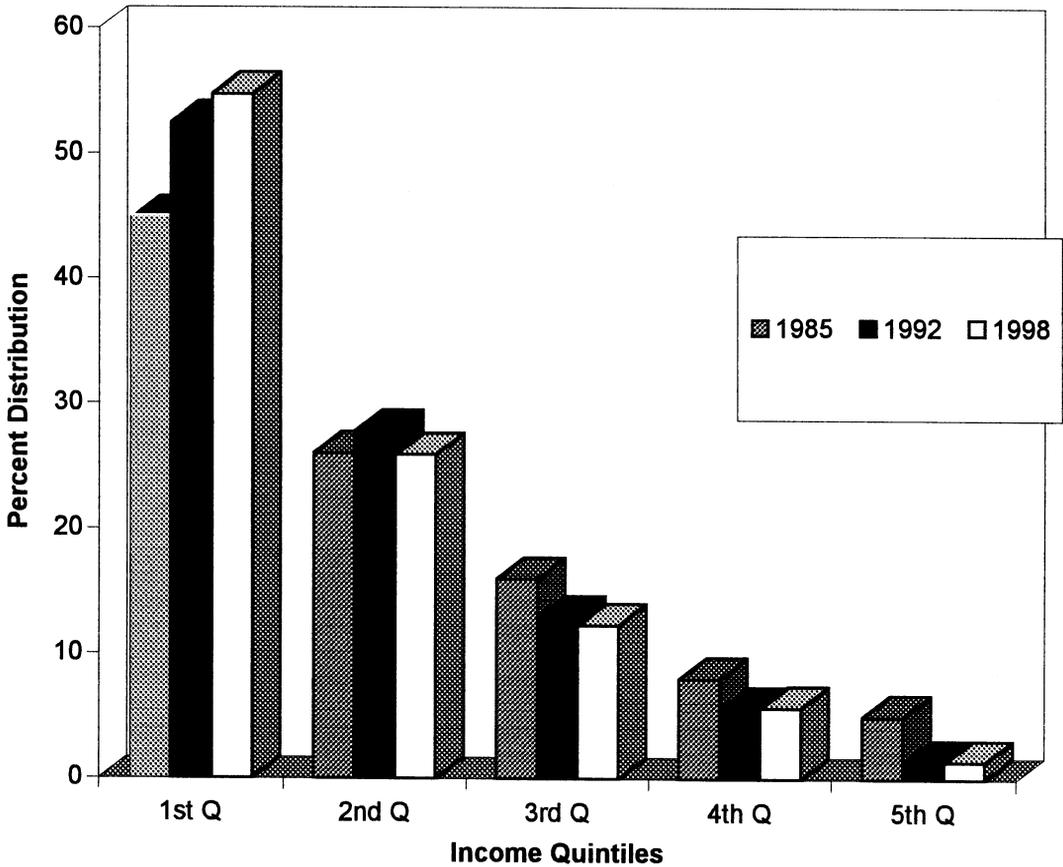


Fig. 1. Distribution of resources by the School Feeding Programme among primary schoolchildren according to income level.

study was carried out by the Ministry of Planning [13] and included extensive data from 37,000 first graders and 26,000 nine graders from two regions of the country. Data was also collected from all the public primary and secondary schoolchildren of those same regions. These regions were selected because they have a significant proportion of population below the poverty level. Although results showed that the vulnerability index for both school levels had a strong correlation with poverty (Spearman’s correlation coefficient fluctuated between 0.445 and 0.525, the study concluded that variables that are presently not included in the models, should also be incorporated, as these correlated almost 100% with poverty. Due to this conclusion, those variables have already been incorporated in the school census carried out in 2000, implying that the models will have to be recalculated for the targeting process of 2001.

In terms of the costs of the targeting process, it is a minor component. The most recent figure indicates that it is US\$ 36,772 per year, less than 0.05% of total budget.

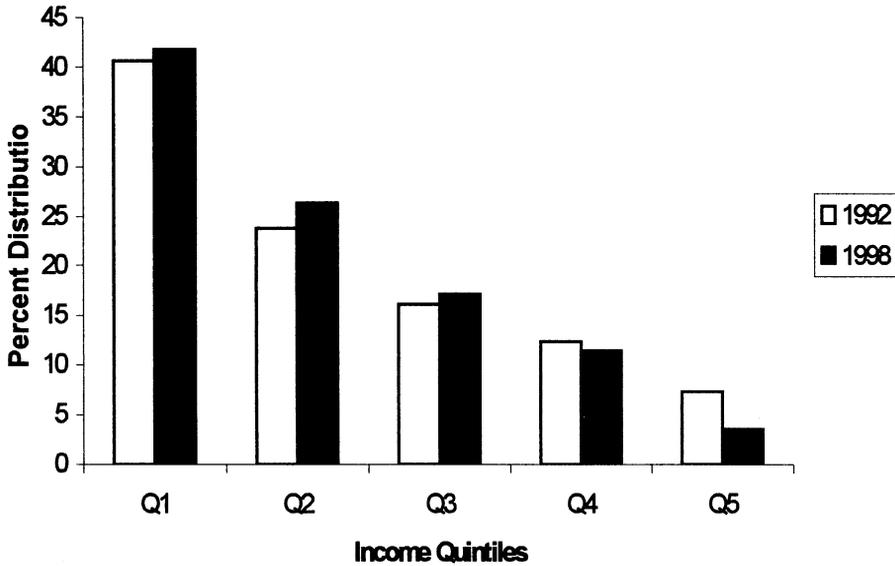


Fig. 2. Distribution of resources by the School Feeding Programme among secondary schoolchildren according to income level.

3. Lessons learned from the school feeding programme

Various targeting strategies have been applied in the SFP; they have been based on information that can be easily obtained through the school census. Selected variables for the model are those shown to be associated with poverty, such as poor physical growth and mother’s educational achievement. Only the information from first grade and ninth grade is considered for targeting the entire school, because it was demonstrated that it represents the situation of the primary and secondary school respectively. Also, it keeps the system of recollecting data simple.

Targeting is constantly monitored by comparing its results with the information from the CASEN surveys provided by the Ministry of Planning. In other words, the model is continuously tested for validity by determining through objective mechanisms if the programme is indeed reaching the most needy [14].

Through the years variables with better predictive values in terms of the child’s need for food as perceived by the teacher have been incorporated. It is noteworthy that teacher’s perception of food needs drive the whole process. This is an important component of the

Table 2
Coverage of the School Feeding Programme by Income Quintiles. 1998

School Level	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Primary	60.8	38.5	26.4	16.7	9.7	40.0
Secondary	34.9	22.2	16.9	12.2	8.0	21.0

targeting system. Teachers clearly must play a role in the targeting process; local decision making is essential for programme success.

The targeting process is dynamic not only with regard to the model, but also to the cut-off points utilized to define the number of beneficiaries and type of benefit. These cut-offs vary according to the economic situation of the country, which in turn influence the SFP's annual budget.

The process of data collection is done gradually during the first semester, while the analyses which serves to develop the targeting model takes up most of the second semester. Finally by the end of the year, the process of ranking the schools by their vulnerability index is finished. Also, the budget process by then is completed, thus the funding allocation for the Programme is known. This permits NBSA to clearly define the number of meals per school before the school year starts. The targeting process is then completed within each school.

Because SFP provides a significant proportion of the daily energy needs, it is an excellent incentive for parents to send their children to school and in turn decrease desertion. In fact, school desertion has declined considerably; in 1986 only 40% of the children in rural areas completed primary education, by 1999 this proportion increased to 70%. This is probably one of the reasons behind the increase in schooling observed among the poor during the last decade.

Finally, this targeting model is used to provide other types of assistance to the children. NBSA has uses the same model to provide other benefits, such as books and school supplies.

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