Chapter 100
The Oportunidades Program and Child Growth: Mexico Perspectives

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Abstract Despite progress over the past decades, stunting remains a major public health problem in Mexico, highly concentrated among those living in poverty. The prevalence of stunting is highest in the country among beneficiaries of Mexico's principal social welfare program, Oportunidades. Oportunidades is a conditional cash transfer program, providing economic incentives for families to invest in themselves and provides specific benefits for education, health, and nutrition. Oportunidades has had an important impact on the growth of children in rural and urban Mexico. Beneficiary children who received the program over the course of the critical period (birth to 2 years of age) grow approximately 1 cm more than non-beneficiary children living in comparable circumstances. Over the 10 years that Oportunidades has existed in rural areas, the prevalence of stunting dropped from 44.3 to 21.8%. The impact is likely in part a direct result of consumption of the fortified food provided for children but use of the food by the population is not ideal. The impact on growth may also be related to the better economic conditions of the families and the influence that this might have on health, hygiene, and caregiving. Despite this positive impact, the challenge remaining to improve child growth in the Oportunidades beneficiary population is great. The prevalence of stunting is still high, over 35% in 2007 among some of the most vulnerable subgroups of the population. Investments to improve the quality of the nutrition and health education component of the program are urgently needed and should focus on the specific causes of growth faltering including breast and complementary feeding practices. The Oportunidades evaluation, as well as providing evidence of its accomplishments, has been extremely valuable to identify and provide evidence on how the program should be strengthened. This experience provides a valuable model of how program evaluation can be used for strengthening program design and implementation.

Abbreviation

UNICEF United Nation Children's Fund

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100.1 Introduction

100.1.1 The Challenge of Improving Child Growth in Mexico

From the 1980s to the early 2000s, Mexico saw a substantial reduction in infant and child mortality (Sepulveda et al., 2006) and improvement in many of the factors that contribute to mortality, including a reduction in the prevalence of acute malnutrition (low weight for height) in children under 5 years of age from 6.2% in 1988 to 2.1% in 1999 (Rivera et al., 2009). Chronic malnutrition, reflected in the prevalence of stunting (low height for age), however, remained high in the 1980s and 1990s with little progress between the decades. In 1999, the national prevalence of stunting was 21.5%, with prevalence as high as 55.1% among those living in the most economically disadvantaged populations, 49.2% among children in households who identify themselves as of indigenous origin, and 48.3% among the those living in rural areas in the southern region of the country (Rivera et al., 2009). From 1999 to 2006, progress toward improved child growth was more marked, particularly among the most vulnerable groups. In 2006, the national prevalence of stunting had decreased by 6 percentage points (15.5%), with prevalence among the poorest, those of indigenous origin and those living in the rural south of 37.6, 34.1, and 30.1%, respectively (Rivera et al., 2009). Although reflective of a positive trend, stunting remains an important public health concern in Mexico, with great disparity across the country. The degree of disparity in the prevalence of stunting in Mexico is demonstrated in Fig. 100.1 by contrasting prevalence among those that could be considered the least vulnerable to those that could be considered the most vulnerable.

Over this same period, the prevalence of overweight and obesity remained steady among preschool aged children (2–4 years of age), with a combined prevalence of 15.7, 19.7, and 14.7% in 1988, 1999, and 2006, respectively. However, among older children and adults the prevalence of overweight and obesity has increased at a dramatic rate, reaching 26.2% among children 5–11 years of age, 30.9% among adolescent girls (12–18 years), and 69.3% in women 20–49 years of age (Rivera et al., 2009). Unlike stunting, variability by economic status is minimal. For example, the combined prevalence of overweight and obesity is 65.9% among adult women in the poorest quintile and 70.7% among those in the highest (Rivera et al., 2009).

The dual challenge to improve growth and reduce the prevalence of stunting while controlling and preferably reversing the tendency toward higher weight is a complex one for Mexico and not unlike the situation in other Latin American countries. The poor in Mexico bare the majority of the

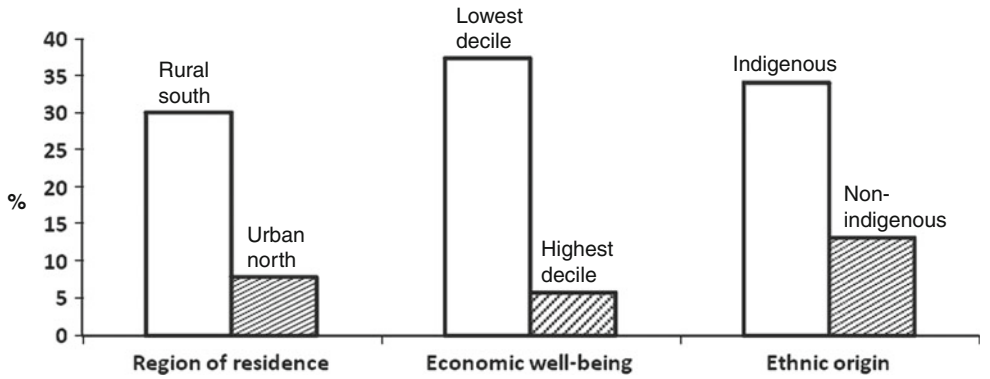

Fig. 100.1 The prevalence (%) of stunting in 2006 among the least and most vulnerable subsets of the Mexican population. Modified with permission from Rivera et al. (2009)

burden of stunting but efforts to address this must take into consideration the high prevalence of overweight and obesity among the poor. In this chapter, we will review the evidence of impact of the Oportunidades program, Mexico's principal social protection program, on child growth and consider some of the challenges remaining for the program.

100.1.2 The Oportunidades Program: Design and Coverage

The *Programa de Desarrollo Humano, Oportunidades* (Program for Human Development, *Oportunidades*) began under the name *Progresa* in rural Mexico in 1997[1] and was expanded to urban areas as of 2002. Budget for the program in 1997 (US $58.8 million) was sufficient only to cover approximately 300,000 families (Levy, 2006). By 2005, Oportunidades had reached its target of covering the poorest quarter of the Mexican population (those considered to be living in extreme poverty), reaching over 5 million families in all 31 states and the Metropolitan area of Mexico City. The budget of Oportunidades is now over US $2.8 billion annually (Levy, 2006).

Oportunidades is designed based on the principle that to be effective, social welfare programs should motivate the poor to invest in their own future (Levy, 2006); Oportunidades provides economic incentives for families to do so. Three critical areas that limit human capital development are addressed within the program: education, health, and nutrition. The actual benefits received, however, depend on family demographics. Families are offered scholarships to keep their children in school (as of third grade), designed to offset not only the cost of educating children but also the lost income to the family from having the child study instead of work. Key features of the Oportunidades program are shown in Table 100.1.

All beneficiary families receive a basic cash transfer and curative health services through the state-run health system. The additional components related to health and nutrition is what gives Oportunidades a high potential to influence child growth. To receive their cash transfer, all families must comply with certain responsibilities, again depending on family demographics. Pregnant women must attend prenatal care and later take their infant/child for regular checkups, including

Table 100.1 Key features of Mexico's conditional cash transfer program, Oportunidades

Benefits
• Basic transfer in cash to each beneficiary family (provided to the female head of household)
• Facilitated access to curative public health-care services
• Fortified complementary food for children 6–24 months of age, and 2–4 years of age with low weight-for-age
• Fortified beverage for pregnant women from first prenatal control to 1-year postpartum
• Cash for children in school as of third grade (higher for higher grades and for females)
Co-responsibilities
• Attendance at health workshops (diverse themes with different family members required to attend according to relevant themes)
• Regular attendance to prenatal control
• Healthy child clinics (growth monitoring, vaccinations, etc.)
• Enrollment and regular attendance (>80%) of children in school

[1] Progresa was re-named Oportunidades when the federal government under President Ernesto Zedillo finished term and President Vincente Fox came to power. For convenience, we will refer to the program throughout the document only by its current name, Oportunidades.

Table 100.2 Composition of the fortified complementary food provided by Oportunidades

Nutrient	Quantity in one portion (44 g of powder[a])
Energy (kcal)	194.0
Protein (g)	5.8
Total fat (g)	6.6
Carbohydrates (g)	27.9
Sodium (mg)	24.5
Iron (mg)	10.0
Zinc (mg)	10.0
Retinol (μg)	400.0
Vitamin E (mg)	6.0
Vitamin C (mg)	50.0
Thiamine (mg)	0.8
Vitamin B_{12} (μg)	0.7
Folic acid (μg)	50.0

[a]Whole milk-based powder to be rehydrated before consumption with three tablespoons of clean water to form a pap

growth monitoring and vaccination. Attendance at health and nutrition educational workshops is obligatory (one per month); the sessions are designed to motivate behavior change and include hygiene, nutrition, and health topics relevant for child growth and development. Finally, the program provides a fortified, whole milk-based food, as a beverage for pregnant women and a pap for children from 6 to 24 months of age (Table 100.2). A nutritional intervention using a fortified food not unlike that provided by Oportunidades has shown important long-term effects on human capital and work productivity (Martorell et al., 2010).

100.1.3 The Oportunidades Program: Potential Routes of Impact on Child Growth

In the long term, Oportunidades with its integrated approach could improve child growth by modifying the underlying basic societal and household/family level causes of undernutrition (UNICEF, 1998), through, for example, improved utilization and quality of health care, improved access to food, and improved hygiene and caregiving practices. Because Oportunidades provides a fortified food and obliges families to participate in preventive and promotional health-care and educational activities, the program also has a high potential to modify the direct causes of malnutrition: inadequate dietary intake and frequent and/or severe infectious disease (UNICEF, 1998). However, this strong design and appropriate theory of change for improving nutritional outcomes will only translate into measurable effects if the program is effective at modifying behaviors related to child care, feeding, hygiene, and health seeking, including regular consumption of the fortified food.

Intense monitoring of operations and rigorous impact evaluation including in-depth ethnographic information as well as the quantitative impact of the program were designed as an integral part of the program. The original rural evaluation took advantage of the gradual rollout of the program. Eligible areas were identified based on a number of economic and other criteria (details in Levy, 2006) and a subset was randomly assigned to receive the program during the first (intervention areas) or subsequent rounds (comparison areas). This design permits direct causal inferences about the impact of the program on nutrition outcomes (Habicht et al., 1999). In urban areas, the program was again gradually rolled out but intervention areas were purposefully selected and appropriate comparison

areas identified using matching techniques. In this case, propensity score matching (Dehejia and Wahba, 2002) was used in an attempt to balance observable and unobservable factors that could affect outcomes (other than program participation) between intervention and comparison areas.

Although much has been published to date in the scientific literature, these publications reflect only a small portion of the richness of information available about Oportunidades, its strengths and weakness and its impact.[2] As part of the evaluation activities, Oportunidades invested intensely not only in measuring the programs effect on intended outcomes, but in the case of nutrition, on many in-depth studies that have attempted to understand how the program is having an effect. In the next section we will review the impact of Oportunidades on child growth and the evidence to date on how that impact may have been achieved.

100.2 The Impact of Oportunidades on Child Growth

Oportunidades has improved linear growth of children in rural and urban areas but this impact was limited to those who were exposed to the program over the majority of the critical period for growth (i.e., who were < 6 months of age at the time of evaluation baseline). Although the evaluation design and thus analysis strategies differed, the results in urban and rural areas are consistent. Two years after implementation in rural and later in urban areas of Mexico, children of Oportunidades beneficiary families who were less than 6 months of age at the start of follow-up had grown approximately 1 cm in length more than children of families living in comparison areas (Rivera et al., 2004; Leroy et al., 2008). Results from urban areas are shown in Fig. 100.2.

Economic status of the family (measured by possession of common domestic goods and materials used for housing construction) also modified the effect of Oportunidades on child growth. In rural Mexico, there was no impact of Oportunidades on child growth over the 2-year follow-up period for children in less-poor families (defined as above the study median using the indicator of economic status), even among those who were <6 months of age at baseline (Rivera et al., 2004). However,

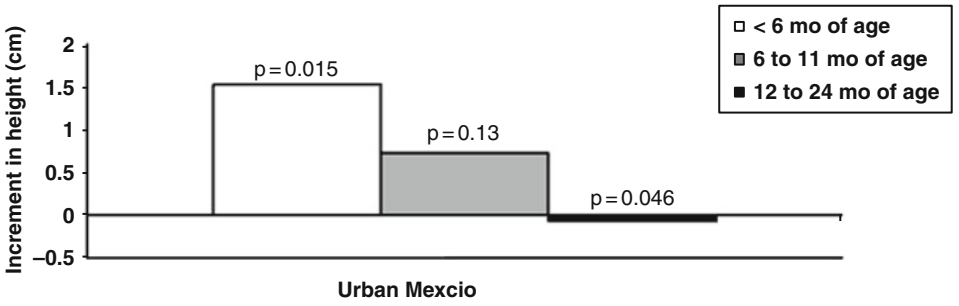

Fig. 100.2 Increment in height (cm) from the Oportunidades evaluation (baseline to follow-up 2 years later) in urban Mexico, stratified by the age at baseline. The sample in urban Mexico included all children in the evaluation. Modified with permission from Leroy et al. (2008)

[2] For a complete listing of publically available evaluation reports, one can refer to the Oportunidades evaluation web site (http://evaluacion.oportunidades.gob.mx:8010/index2.php?a=640). The majority of the reports are available in Spanish and English.

there may be weaknesses in this stratified analysis because baseline economic status was not available and the authors used status in 2000 as a proxy. Given the documented impact of Oportunidades on household economic status (see, for example, Attanasio and Di Mario, 2005) the overall impact of the program may actually be underestimated, if improvements in economic status of families of children in the sample results in the misclassification of their economic status using the 2000 data.

In urban areas, there was a statistically non-significant tendency ($p = 0.095$) toward positive impact of Oportunidades on growth in children in the poorest tertile of baseline economic status (Leroy et al., 2008). Lack of statistical significance is likely due to the fact that children over the entire age range were included not just those <6 months of age at baseline. Unfortunately, sample size was too small to stratify by age and economic status.

In urban Mexico, incorporation into Oportunidades was also associated with an increase in child weight among those who were < 6 months of age at baseline (+0.763 ± 0.310 kg, $p = 0.007$) (Leroy et al., 2008). Although some of that impact may be explained by the increase in height, improved linear growth does not explain all. Weight-for-height *Z*-score was also significantly higher among children of beneficiary families than matched controls (+0.465 ± 0.216, $p = 0.016$). Impact on weight and weight-for-age *Z*-score was not reported as part of the rural evaluation.

Measuring program impact on an outcome such as growth, with the myriad of genetic and environmental factors that influence it, is complex. Unlike in randomized controlled research studies, ensuring comparability between intervention and control groups in a programmatic setting for factors other than the program itself may be difficult. Even with randomized evaluation, as was the case with the original evaluation design in rural Mexico, there may be differences in program implementation that favor or disfavor the possibility of detecting impact. In rural Mexico, random assignment of communities to treatment and control groups (and later adjustment for this design in the evaluation) did result in balance between groups for a number of influences on child growth, such as age, sex, and baseline status (Rivera et al., 2004). However, there appear to have been important differences in how the program was actually implemented in the communities, with reports of discretionary distribution of the fortified food supplement in intervention communities with preference given to malnourished children, whether beneficiaries or not (Behrman and Hoddinott, 2001). This may in part explain why Rivera et al. (2004) reported consumption of the fortified food by some children in the comparison group. A reanalysis of the data using econometric methods and considering actual receipt of benefits (e.g., fortified foods) found impact of slightly higher magnitude than the overall program impact, approximately 1 cm per year (Behrman and Hoddinott, 2001).

100.3 Evidence of How Oportunidades Has Improved Child Growth

Assessing mediating factors between the proposed intervention and outcome should be a fundamental part of evaluation research to ensure that any impact (or lack thereof) can be adequately understood and any corrective actions necessary implemented in the program (Peterson, 2010). This information is also vital to ensure that scarce resources are placed in the best investment with the highest potential to achieve program goals. In the case of Oportunidades, this implies that we must understand not only whether among beneficiary children there was a change in the direct causes of linear growth faltering (dietary intake and illness) but also the route by which any observed changes may have occurred. As mentioned, Oportunidades may have modified dietary intake not only directly through the consumption of the nutritional supplement but also through increased purchasing power and appropriate orientation through nutrition education to improve the quality of home foods and

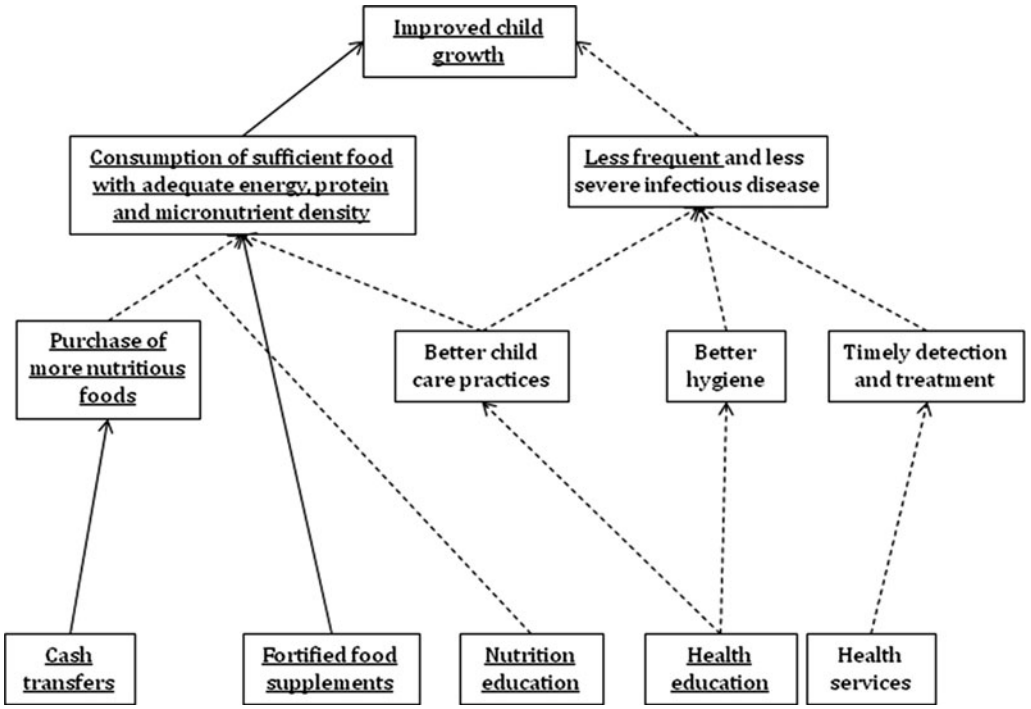

Fig. 100.3 Schematic representation of how Oportunidades may directly and indirectly influence child growth, using the UNICEF (1998) conceptual framework as basis for the identification of potential causal pathways. Factors for which information is available are *underlined*. *Solid lines* represent pathways for which evidence of a positive impact of Oportunidades has been documented

complementary feeding patterns. Illness may also have been reduced through improved caregiving and hygiene practices, through improved health-seeking behavior, or early identification and adequate channeling of nutritional problems through growth monitoring. Figure 100.3 provides a graphic representation of these potential routes of impact with all those for which we have information as part of the evaluation underlined. Relationships for which evidence of a positive impact of Oportunidades exists are represented by solid lines.

100.3.1 Impact on the Underlying Causes of Growth Faltering

Oportunidades has had a positive impact on a number of underlying, household-level determinants of child stunting. Improved economic well-being, estimated as total cumulative cash transfers received by the family over the course of their time on the program, was found to be associated with improved child height after adjustment for multiple potential confounders (Fernald et al., 2009). How cash actually resulted in better growth, however, is not apparent from this analysis. In rural areas, beneficiaries reported having purchased more foods rich in nutrients often limiting for growth, such as dairy products, meat, and fruits and vegetable (Attanasio and Di Mario, 2005). Whether this translated into increased consumption of these foods among children during the critical period for growth (6–24 months of age), however, cannot be addressed with this type of household-level data. Improved household resources may have improved growth via other mechanism such as decreased

risk of infection through improved hygiene. Whatever the route of impact, the effect found to be associated with cash in this analysis did not account for the entire impact of Oportunidades on child growth.

As would be expected from the conditional nature of the program, children of beneficiary families were taken to the health center for preventive and promotional health checkups more frequently than children from families without Oportunidades (Dantes Gomez et al., 2005). However, the actions likely to take place at these sessions, particularly growth monitoring, are unlikely to have a direct effect on child growth (Bryce et al., 2008). Furthermore, the quality of the care provided as part of the Oportunidades program in general (Gutierrez et al., 2008) and the quality of the educational sessions related to the specific nutrition components of the program, i.e., the use of the fortified foods (Escalante-Izeta et al., 2008; Bonvecchio et al., 2007), have been strongly criticized.

Based on qualitative analyses and the survey data, it appears unlikely that the education component of the program has resulted in important changes in breast and complementary feeding practices that might have favored child growth. Initiation of breastfeeding is very high (over 95% in urban and rural Mexico) but the duration of exclusive breast feeding is low and the total duration of breastfeeding was actually 1.5 months shorter among beneficiaries than matched controls in urban areas (Neufeld et al., 2006). In 2007, complementary feeding patterns in rural areas were still far from recommended, with early introduction of liquids other than breastmilk (well before 6 months of age) (Neufeld et al., 2008b). Common complementary foods include thin soups and other foods likely to have low nutrient density.

100.3.2 Impact on the Direct Causes of Growth Faltering

To assess whether Oportunidades improved dietary intake in children, 24-h dietary recalls were done on 2 non-consecutive days, four times over the course of 1 year (total of eight recalls per child) on a subset of children 6–36 months of age participating in the urban evaluation (Neufeld et al., 2006). No overall difference was found in dietary intake of energy, protein, fat, or micronutrients between beneficiary children and matched controls. Among those children whose mothers reported that the child had consumed any amount of the fortified food on the previous day, total dietary intakes of zinc, iron, and folate were significantly higher among consumers than all other children (beneficiaries or not). However, total intake, even among those who consumed the fortified food still fell below age-appropriate estimated requirements. There was no difference between consumers and non-consumers of the fortified food for energy, protein, fat, or vitamin A in urban areas.

These analyses imply that children who consume the fortified food likely have higher intakes of micronutrients such as zinc, known to be limiting for child growth (Rivera et al., 2003). We do not know, however, whether consumption is sufficient to have an impact on child growth. In urban areas, only 33% of mother's reported that their children had consumed the fortified food in the previous 2 weeks, and among them, they had consumed on average, only 50% of the recommended portion (Neufeld et al., 2005). This was found to be due mainly to intra-household sharing of the food and not to the lack of acceptability (Escalante-Izeta et al., 2008; Bonvecchio et al., 2007). If this is a typical pattern, we might expect that a given child might receive supplement on approximately one-third of the intended 18 months or approximately 6 months over the 6- to 24-month period and would receive on average half the intended dose of iron, zinc, and the other nutrients in the food and less than 100 kcal per day consumed (see Table 100.1). A more recent survey found that only 29.6–39.3% (depending on geographic and demographic group) of children 6–24 months of

age in rural areas had received the fortified food in any quantity on the day before the interview (Neufeld et al., 2008b). Whether this is sufficient to have had an impact and how much child growth may have benefited further with more regular consumption of the supplement cannot be estimated from the evaluation data. To do so, we would require more detailed information on actual intake of the supplement and preferably also home diet over the first 2 years of life. This intensity of data collection might alter behavior in a program context and would require methodology different than that used for the evaluation. This information would also have been useful to understand the finding of higher weight gain among beneficiary children reported by Leroy et al. (2008).

The impact evaluation surveys have also included estimations on child morbidity. As with dietary intake, illness is most likely to influence child growth if it occurs frequently or is long lasting or severe, concepts difficult to measure in occasional evaluation surveys. In 2007, 10 years after Oportunidades was implemented in rural Mexico, morbidity was estimated by maternal recall of child illness symptoms. During the 15 days prior to the interview, 37% of children had some illness, mainly cough and fever; no difference in the prevalence or perceived severity of child illness was found between children from families incorporated and not incorporated in the program (Bautista Arredondo et al., 2008). However, in 2007 comparisons of program impact are difficult given that most families eligible for Oportunidades are incorporated, unless they have chosen not to do so. Clearly, self-selection into the program may also distinguish families on factors that affect child illness and growth. Earlier evaluations of the program found that in children 0–5 years of age, the reported incidence of illness (in previous 15 days) was 12% lower in children of beneficiary than non-beneficiary families (Gertler, 2000).

It is possible that other factors not presented here contribute to child health and growth and were influenced by Oportunidades and are thus potential confounders. Fernald and Gunnar (2009) found that Oportunidades was associated with decreased salivary cortisol levels, an indicator of stress, among children of women with high depressive systems. Maternal depression has been found to be associated with poor child growth in some but not all studies (reviewed by Engle, 2009); one author concluded that the affect may be limited to those living in the most economically disadvantaged situations (Stewart, 2007). Unfortunately, data are limited to further explore these relationships in the Oportunidades data sets, so they have been excluded from the conceptual framework.

100.4 Conclusions

The impact of Oportunidades on child growth has been evaluated in rural and urban Mexico, using diverse study designs and statistical methodologies. Children from families with the program grow approximately 1 cm more during the critical period for growth than children living in comparable circumstances without the program. The consistency in these findings across region, study design, and analysis strategy provides substantial credit to the robustness of this estimation.

Oportunidades includes multiple components that have been shown to influence child growth. Given the integrated design and the evaluation strategy, it is impossible to quantify the exact contribution of each of these factors to the impact. However, to provide useful feedback to the program itself on areas that require strengthening and to contribute to the knowledge base useful for program design in other countries, it is fundamental to hypothesize about these relationships and use the available evidence to have some grasp on the mechanisms of impact. Child health was improved by Oportunidades and this may to some unquantifiable amount have reduced restrictions on child growth. Although the evaluations have not been designed in a way to specifically measure the impact

of the health and nutrition education component on hygiene and feeding practices, given the concerns of quality, it appears unlikely that the education component has or will improve child caregiving or feeding patterns in the population unless strengthen substantially.

It seems likely that at least in part, the impact of Oportunidades on child growth is due to the fortified food; the composition of the fortified food lends it excellent potential to improve child growth. However, the current pattern of use appears insufficient to completely bridge the gap in intake of nutrients limiting for child growth. How much that could be improved if consumption of the fortified food was improved and how that could be achieved are not clear. Previous efforts to improve the pattern of use of the foods were not successful, despite good results under controlled conditions (Bonvecchio et al., 2007). Purchase of the fortified food represents a great expense for the program (Levy, 2006). Other supplements may have higher potential for impact, whether because they are more efficacious or because they lend themselves to a more favorable pattern of use. A recent study showed no difference in height at 24 months of age in children consuming the fortified food than children consuming a micronutrient powder or syrup with micronutrient content identical to that of the fortified food (Neufeld et al., 2008a). Consumption of all three supplements showed a significant dose–response after adjusting for many potential confounding factors (Neufeld et al., 2009). The micronutrient powder, however, may possibly have a higher potential for regular use from 6 to 24 months of age (Flores et al., 2008).

One important observation in the study reported above was that children already had a length deficit between 6 and 12 months of age, with mean length-for-age *Z*-score of approximately –1 (Neufeld et al., 2008a). It is unlikely that any nutritional supplement beginning at 6 months of age could entirely reverse that deficit. To prevent this, ensuring adequate maternal nutritional status during pregnancy (Shrimpton et al., 2009) and appropriate breastfeeding and control of infection during the first 6 months of age is fundamental. The nutrition education component of Oportunidades could be much strengthened in this respect.

100.5 Remaining Challenges for Improving Growth in Oportunidades Beneficiaries

The challenge to improve child growth in the Oportunidades beneficiary population remains large. An examination of the situation in the Oportunidades population now, more than 10 years after its inception, can help to interpret whether the impact on growth has been sufficient and the challenges that remain. A follow-up of the evaluation sample in urban areas is currently underway and results will likely become available in 2010. In 2007, children 0–24 months of age were measured in the same rural communities where the original impact evaluation was done. It is clear that stunting remains a major problem in the Oportunidades population. However, in the communities that participated in the rural evaluation, the prevalence of stunting is now less than half that observed before the program began (44.3 vs. 21.3%) (Rivera et al., 2004; Neufeld et al., 2008b). As with the national data in Mexico, this number hides great diversity, even within the beneficiary population of Oportunidades. Among beneficiaries in the lowest tertile of economic well-being the prevalence of stunting is 32.0%, compared to 14.1% among those in the highest tertile (Fig. 100.4). There is also considerable variability by state, from 16.1% in San Luis Potosi to 36.3% in Guerrero, and by indigenous origin (33.9%) compared to non-indigenous origin (20.0%). At this time, there is no difference in the program benefits or co-responsibilities between urban and rural, geographical or any other area. One of the challenges to Oportunidades in the future will be how the program may

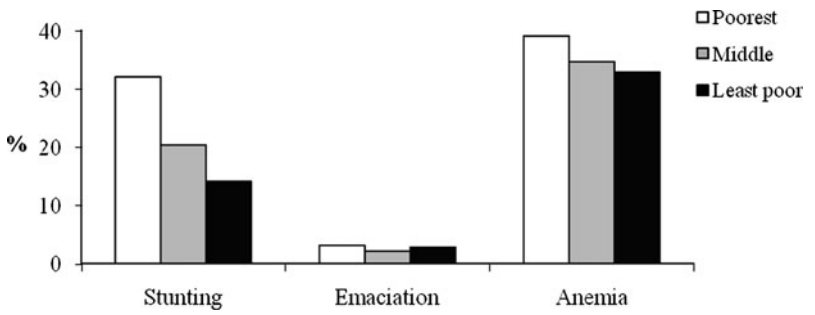

Fig. 100.4 Prevalence (%) by tertile of economic status of stunting (low height for age), emaciation (low weight for height), and anemia in children <2 years of age, beneficiaries of Oportunidades in rural Mexico, 2007. Modified with permission from Neufeld et al. (2008b)

need to adapt to respond to the great variability in nutritional problems within its beneficiary population. Oportunidades is currently conducting studies to determine whether the effectiveness and cost effectiveness of the nutritional component can be improved through improvements in the education component and the types of supplements provided.

100.6 Applications to Other Areas of Health and Disease

Setting appropriate expectations for what can be accomplished for child growth through national social programs is extremely difficult. The magnitude of a demonstrable impact from a program will depend on the potential of the intervention(s) included, evidence that will come mainly from efficacy or controlled trials. How to extrapolate these to realistic programmatic settings is not always clear. Doing so appropriately can help set reasonable expectations among interest groups (e.g., governments) and ensure that "biologically important" impacts, even if small, will not be discarded as irrelevant. On the other hand, setting expectations too low may result in lack of motivation on the part of government as they may see the program as cost and effort inefficient. We recount here the experience with Mexico's conditional cash transfer program, Oportunidades, but the lessons learnt can apply to many areas of program evaluation. The fact that Oportunidades was able to document an impact on nutritional as well as educational and economic outcomes ensured its sustainability through government change, which is a unique accomplishment in Mexico (Levy, 2006). However, knowledge of the magnitude of impact is insufficient to ensure that the program is operating at its highest potential or whether (and how) it could be strengthened. Program evaluation should include sufficient information on mediating factors and the impact of the program on them to gain insight into mechanisms of impact and factors within the program that require strengthening.

Summary Points

- The Oportunidades program has had a positive impact on child growth in rural and urban Mexico among children exposed over the critical period for growth (6–24 months of age).
- The program has not eradicated the problem of linear growth faltering in Mexico and much remains to be done to reach that goal.

- Enormous disparity exists in the prevalence of stunting by subgroup of the Mexico Oportunidades beneficiary population; the original design of the program did not reflect the potential diversity in causes of linear growth faltering or their severity within these subgroups.
- Further efforts should be made to adapt the program to the needs of specific subgroups within the Mexican population.
- Maternal nutrition and appropriate breastfeeding and health in the first 6 months of life require specific attention to prevent growth deficit during this period.
- Health services, including health and nutrition education, should be strengthened to increase potential to improve growth in the population.
- Efforts to improve linear growth must not further contribute to the growing problem of excess weight in the country.

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