Growth and Nutrition: Round 4 Preliminary Findings

Young Lives

Preliminary Findings from the 2013 Young Lives Survey (Round 4): Peru

Young Lives provides an excellent opportunity to follow the growth and nutrition of two cohorts of Peruvian children from infancy through childhood and then from childhood to adulthood while also studying household food security and the quality of food available for children as measured by the variety of the diet they consume. The Round 4 survey carried out in 2013 documents that stunting has decreased over time with lower rates among the Younger Cohort at age 12 compared with the Older Cohort when they were the same age in 2006, but gaps between urban and rural children remains. Overweight and obesity has increased most markedly in the Older Cohort girls (aged 19 in 2013), especially among those who are now mothers. Although there has been a small increase in households experiencing severe food insecurity, there has also been a larger increase in the number of households who are now food-secure and while the quality of the diet measured by dietary diversity has not changed, there is some indication of increased consumption of some animal-source foods, which provide easily assimilated essential micronutrients necessary for health and optimum growth.

Introduction

Chronic infant malnutrition is associated with long-term consequences for children's development including lower cognitive skills, poorer school achievement, and lower wage-earning capacity as adults. Infants and young children with chronic malnutrition are stunted (short for their age), that is their length or height is less than 2 standard deviations below the international reference values (World Health Organization). The prevalence of stunting is a useful indicator of national economic and social development. The Peruvian government has declared the reduction of infant chronic malnutrition to be a national priority and significant advances have been made over the last 10 years (Loret de Mola et al. 2014).

Nevertheless chronic malnutrition remains common and there is now an added and increasing problem of overweight and obesity among children as well as adults. Overweight and obesity are associated with adverse health consequences such as a high risk of diabetes and hypertension, conditions that are increasingly common in Peru (Aballay et al. 2013).

Young Lives follows children as they grow from infancy to adulthood and so provides an opportunity to study both linear growth (height) and weight gain.

Nutrition is an important determinant of a child´s growth at all ages. Young Lives has measured children' access to an adequate diet in two ways: household food security (the amount and frequency of food available) and dietary diversity which helps us to assess how likely it is that a child will have all if his/her nutritional requirements covered.

Key findings

- We have reported elsewhere that some children in this cohort have shown the potential for catch-up growth with recovery from stunting, and Round 4 data shows that this tendency has continued. The overall stunting rate among the Younger Cohort at age 12 is now 21% – half that of the Older Cohort at the same age in 2006 (42%).
- This reduction in stunting has been across the board but the gaps between better-off and the poorest children remain. Stunting among children from better-off households fell from 25% to 7%, compared with a fall from 57% to 36% among the poorest children, who still have very high rates of stunting.
- There has been a general increase in overweight and obesity over time but a much larger increase in the Older Cohort at age 19. More than a third of the girls are now overweight or obese, looking set to contribute to the levels of 60% of overweight and obesity documented in adult women in Peru.
- Before puberty boys tended to be fatter but after puberty girls have overtaken them. Twice as many girls are overweight or obese at age 19 than at the age of 15 (in 2009). This is across all socio-economic groups but the largest increases are among children from an indigenous background, the poorest families and in rural areas.
- One in four of the girls had a child by the age of 19 and 56% of them are now overweight or obese compared with 30% of girls who have not had a child.
- Food security is improving with 44% of households reporting no problems in access to sufficient and preferred foods (up from 27% in 2009).There has been a small increase in families who are experiencing severe food insecurity (these families were urban poor).

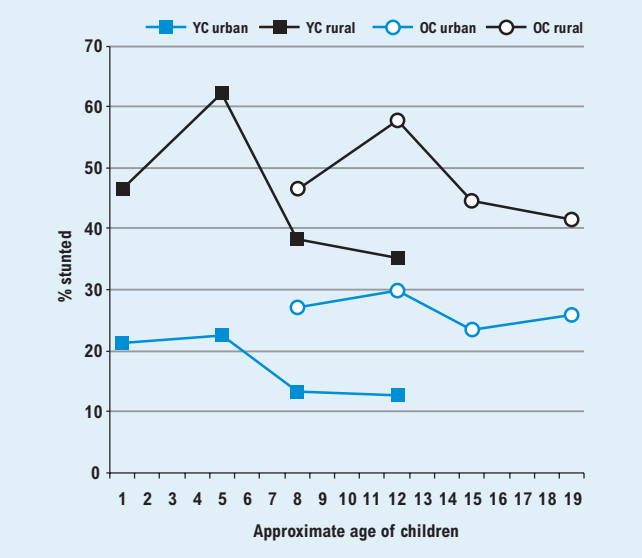
Child nutrition and growth

Stunting

Figure 1 shows the prevalence of stunting over time in the Younger Cohort children highlighting the marked differences between rural and children that continue throughout their childhood. A similar gap is seen in the Older Cohort.

We have reported elsewhere that some children in this cohort have shown the potential for catch-up growth with recovery from stunting, as measured by height-for-age Z-score (HAZ) score (Crookston et al. 2013), and Round 4 data shows that this tendency has continued, resulting in a decrease in the prevalence of stunting in 11-12-year-old children, which is now well below the prevalence of stunting documented in the Older Cohort at the same age (Figure 1). The graph allows us to compare the height-for-age of the two cohorts over the same period (between 8 and 12 years of age). The striking difference between the cohorts is evident: while stunting rates increased in the Older Cohort over this age period, especially among rural children, stunting has reduced within the Younger Cohort. The overall stunting rate of 21% in the Younger Cohort is half that of the Older Cohort at age 12 (42%).

Figure 1. *Prevalence of stunting over time (both cohorts)*



This reduction in stunting in the Younger Cohort has been across the board but the gaps between the better-off and the poorest children remain. Stunting among children from better-off households fell from 25% to 7%, compared with a fall from 57% to 36% among the poorest children, who still have very high rates of stunting. Similarly, stunting among children of better-educated mothers (who are likely to be better-off) reduced from 18% to 5% and stunting also decreased among children whose mothers had incomplete primary education (from 53% to 32%).

Overweight and obesity

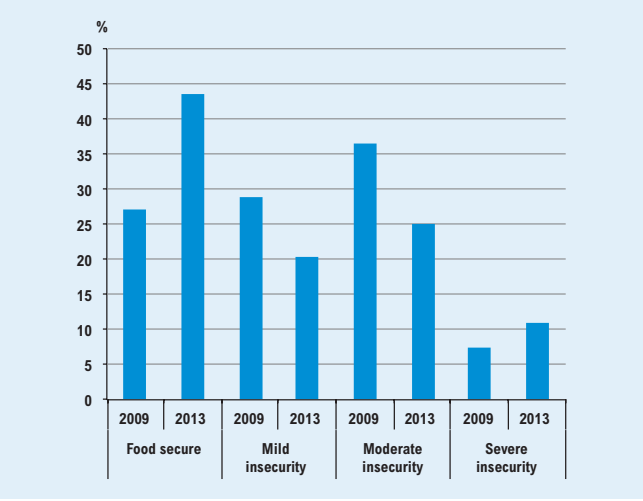
Table 1 shows the prevalence of overweight and obesity in the two cohorts over the last 3 survey rounds. There is a general increase in overweight and obesity across the earlier rounds but a much larger increase in its prevalence in the Older Cohort in Round 4 (age 19).This is across all socio-economic groups but the largest increases are among children from an indigenous background, the poorest families and in rural areas. Most striking is the gender difference: before puberty boys tended to be fatter but after puberty girls have overtaken them and there has been a doubling of the percentage of girls who are overweight or obese between 2009 and 2013 (with no increase among the boys over the same time period).

More than a third of the girls are now overweight or obese, looking set to contribute to the levels of 60% of overweight and obesity documented in adult women in Peru (Loret de Mola et al. 2014). Six per cent of girls are obese, the highest rates being among the daughters of the relatively more wealthy, urban and Spanish-native language mothers. One in fourof the girls has had a child by the age of 19 and of these 56% are overweight and obese compared with 30% of girls who have not had a child, but even this is double the rate of overweight and obesity in boys.

Household food security

In order to measure the extent of food insecurity, we used the Household Food Insecurity Scale (HFIAS) which categorises households into four levels of food insecurity. This scale measures food-related family circumstances over the previous year ranging from 'never lacking the sort of food they like' (food secure); 'having enough food but not the quality they would like' (mild insecurity); 'experiencing occasional lack of food resulting in less to eat or missing meals' (moderate insecurity); or in the worst scenario,'episodes of having nothing to eat all day' (severe insecurity).

Figure 2. *Household-level food insecurity (Younger Cohort households)*



Between our survey in 2009 (Round 3) and 2013 (Round 4), food security has improved with 44% of households reporting no problems in access to sufficient and preferred foods (up from 27% in 2009). The largest improvements are in indigenous and rural households. On the other hand, there has been a small increase, from 7.5% to 11%, in families experiencing severe food insecurity. These families were urban poor.

Dietary diversity

Dietary diversity documents the variety of foods eaten by the child the previous day. Foods are categorised into nine

groups and the number of groups the child has eaten provides a measure of how likely the child is to have covered all their nutritional requirements, a measure of dietary quality related to adequate growth (FAO 2011).

In terms of dietary quality, both the Younger Cohort and Older Cohort children report, on average, eating food from between 5 and 6 of the 9 food groups, regardless of place of residence, maternal education level or household wealth level. In the Older Cohort the average number of food groups is similar across the board, but in the Younger Cohort there has been a significant levelling. Where previously the children of wealthier urban families and Spanish-speaking and better-educated mothers ate a small but significantly greater diversity of foods, there has been a reduction in diversity in diets of the better-off children and an improvement in the poorer groups, resulting in a significant reduction in the gaps.

This same instrument can be used to compare the consumption of specific food groups. For instance in Younger Cohort between Round 3 (2009) and Round 4 (2013), the increase in the percentage of children from poor families who drank or ate milk products on the day before we interviewed them was 26% compared with an increase of 15% for children from the wealthiest families. Consumption of meat, poultry or fish remained high among the richest families, but increased among poor families from 41% to 76%. This suggests that access to these nutritious animal-source foods had increased by 2013 among poorer households in keeping with the other nutrition indicators.

Conclusions

The longitudinal design of Young Lives, following two cohorts of children over time, has enabled us to describe a significant improvement in stunting after age 2 years especially among less-privileged children. This has been associated with better cognitive skills in those children who show catch-up growth compared with those who remain stunted. At the same time there have also been improvements in living conditions, including the diet and health, of children over the last 8 years, accompanied by an increase inthe number of food-secure households.

On the other hand, Young Lives data also show how Peru is now facing a double burden of malnutrition with increasing prevalence of overweight and obesity, illustrated by the fact that there are now twice as many Younger Cohort children who are overweight and obese at the age of 12 compared with the Older Cohort children at the same age in 2006. Overweight and obesity is most evident in the wealthier, urban children but the marked increase in overweight and obesity that has been documented among the post-pubertal girls inthe Older Cohort, while higher in urban areas is not limited to this environment, and is of considerable public health importance.

Table 1. *Prevalence of stunting (%)*

	Younger Cohort				Difference R1 to R4	Older Cohort				Difference R1 to R4
	2002 (age 1)	2006 (age 5)	2009 (age 8)	2013 (age 12)		2002 (age 8)	2006 (age 12)	2009 (age 15)	2013 (age 19)	
Average	30.8	37.3	22.6	21.0	-9.82***	35.6	42.3	32.8	32.8	-2.87
Gender										
Boys	35.3	36.1	24.0	20.1	-15.21***	40.9	43.4	35.4	38.8	-2.06
Girls	26.4	38.6	21.2	21.8	-4.52***	30.0	41.1	30.1	26.3	-3.73
Gap (%)	8.96***	-2.47	2.85	-1.74	-10.7***	10.84***	2.3	5.28	12.51***	1.67
Baseline poverty (real household expenditure per capita from Round 2)										
Top quintile	15.0	15.3	9.2	7.0	-8.02***	16.6	25.1	25.4	20.6	4.05
Bottom quintile	46.1	59.1	36.7	36.1	-10***	49.6	56.9	40.2	36.3	-13.31**
Gap (%)	-31.08***	-43.76***	-27.46***	-29.1***	1.98	-33***	-31.87***	-14.81**	-15.64**	17.36**
Area of residence (in Round 1)										
Urban	21.3	22.6	13.2	12.5	-8.73***	27.1	29.8	23.5	25.8	-1.29
Rural	46.7	62.2	38.4	35.2	-11.56***	46.3	57.9	44.5	41.5	-4.83
Gap (%)	-25.46***	-39.58***	-25.27***	-22.63***	2.83	-19.15***	-28.09***	-20.98***	-15.61***	3.54
Mother's first language										
Spanish	21.5	26.1	14.7	14.3	-7.21***	27.5	35.3	22.3	27.6	0.04
Indigenous language	47.8	58.0	37.0	33.3	-14.57***	46.1	52.2	46.8	39.6	-6.51
Gap (%)	-26.37***	-31.95***	-22.27***	-19.01***	7.36***	-18.55***	-16.9***	-24.49***	-11.99***	6.55
Maternal education level										
Higher education	13.2	10.4	4.7	5.4	-7.74***	15.5	17.7	10.4	21.2	5.74
Complete primary or secondary	25.0	31.9	19.5	18.2	-6.77***	26.6	36.4	25.3	29.0	2.36
Incomplete primary or less	47.2	57.9	35.3	32.1	-15.03***	47.6	52.8	43.1	38.1	-9.5*
Gap (%)	-33.98***	-47.48***	-30.63***	-26.7***	7.29*	-32.09***	-35.16***	-32.69***	-16.85**	15.24*

Data is for children interviewed in all 4 survey rounds. Differences are significant at ***1%, **5% and *10%. Gaps are percentage points.

Table 2. *Prevalence of overweight/obesity (BMI >1SD) (%)*

	Younger Cohort			Older Cohort			
	2006 (age 5)	2009 (age 8)	2013 (age 12)	2002 (age 8)	2006 (age 12)	2009 (age 15)	2013 (age 19)[1]
Average	31.7	25.5	29.6	22.1	17.2	16.5	25.3
Gender							
Boys	37.0	29.8	32.7	25.3	17.1	14.3	15.6
Girls	26.4	21.2	26.6	18.7	17.2	18.9	35.8
Gap (%)	10.54***	8.64***	6.14***	6.57**	-0.04	-4.61	-20.24***
Baseline poverty (real household expenditure per capita from Round 2)							
Top quintile	37.4	39.9	44.3	28.1	28.6	23.5	29.3
Bottom quintile	29.4	14.3	12.5	19.1	10.4	11.6	20.9
Gap (%)	8.03**	25.58***	31.77***	9	18.21***	11.93**	8.41
Baseline area of residence (Round 2)							
Urban	32.9	32.0	39.2	26.5	22.5	20.9	29.7
Rural	29.6	14.5	13.5	16.7	10.5	11.0	19.8
Gap (%)	3.34	17.52***	25.62***	9.88***	12.03***	9.97***	9.89***
Maternal education level							
Higher education	40.6	45.3	52.3	16.6	20.9	14.2	25.0
Complete primary or secondary	29.1	25.7	31.8	28.4	20.3	17.4	28.1
Incomplete primary or less	31.5	15.9	16.1	17.7	13.4	16.1	23.1
Gap (%)	9.02***	29.35***	36.13***	-1.12	7.54	-1.86	1.95
Mother's first language							
Spanish	32.4	29.7	37.4	25.6	22.5	19.8	28.7
Indigenous language	30.4	17.8	15.4	17.9	10.2	12.3	21.2
Gap (%)	1.97	11.85***	21.98***	7.7**	12.32***	7.45**	7.45**

Data is for children interviewed in all 4 survey rounds. Differences are significant at ***1%, **5% and *10%. Gaps are percentage points.
1 Note: Girls who were pregnant at the time of the interview were not included.

REFERENCES AND FURTHER READING

Aballay, L.R., A.R. Eynard, M. del Pilar Díaz, A. Navarro and S.E. Muñoz (2013) 'Overweight and Obesity: Their Relationship to Metabolic Syndrome, Cardiovascular Disease, and Cancer in South America', *Nutrition Reviews* 71.3:168-79.

Coates, J., A. Swindale and P. Bilinsky (2007) *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3)*, Washington DC: FHI 360/FANTA.

Crookston, B.T., W. Schott, S. Cueto, K.A. Dearden, et al. (2013) 'Post-infancy Growth, Schooling and Cognitive Achievement: Young Lives', *American Journal of Clinical Nutrition* 98: 1555-63.

FAO (2011) *Guidelines for Measuring Household and Individual Dietary Diversity*, Rome: Food and Agriculture Organization of the United Nations.

INEI (2013) *Encuesta Demográfica y de Salud Familiar 2012* [Demographic and Health Survey 2012], Lima: Instituto Nacional de Estadística e Informática.

Loret de Mola, C., R. Quispe, G.A. Valle and J.A. Poterico (2014) 'Nutritional Transition in Children under Five and Women of Reproductive Age: A 15-year Trend Analysis in Peru', *PLOS ONE* 9.3. e92550.

ACKNOWLEDGEMENTS AND CREDITS

This is the fourth of a series of fact sheets giving a preliminary overview of some of the key data on children's nutrition outcomes emerging from Round 4 of the Young Lives household and child survey. It was written by Mary Penny from IIN with assistance from Guido Melendez at GRADE. Other factsheets cover *Survey Design and Sampling*; *Changes in Household Welfare*; *Education and Learning*; and *Youth and Development*. We thank our colleagues Santiago Cueto, Javier Escobal, Caroline Knowles, Alejandra Miranda, Vanessa Rojas and Alan Sánchez for comments and suggestions. In particular, we would like to thank the Young Lives children and their families for their participation and time which they give so freely and generously, as well as our teams of field researchers and data management staff for their dedication and enthusiasm.

In Peru, Young Lives is known as Niños del Milenio and is a partnership between the Instituto de Investigación Nutricional (IIN), the Grupo de Análisis para el Desarollo (GRADE), and the University of Oxford. Young Lives is funded by UK aid from the Department for International Development (DFID) and co-funded from 2010 to 2014 by the Netherlands Ministry of Foreign Affairs and from 2014 to 2015 by Irish Aid. The views expressed are those of the author(s). They are not necessarily those of, or endorsed by, Young Lives, the University of Oxford, DFID or other funders.

Niños del Milenio
Información para el desarrollo

Funded by

UKaid from the British people

Ministry of Foreign Affairs of the Netherlands

Irish Aid
An Roinn Gnóthaí Eachtracha agus Trádála
Department of Foreign Affairs and Trade

Young Lives/Niños del Milenio
c/o GRADE, Av. Grau 915, Barranco, Lima
E-mail: ninosdelmilenio@grade.org.pe
www.ninosdelmilenio.org