Young Lives

January 2018

Growth and Nutrition:

Preliminary Findings from the 2016 Young Lives Survey (Round 5): Peru

This fact sheet presents findings from the fifth round of the Young Lives survey of children in Peru. Young Lives has followed two cohorts of children born seven years apart since 2002. The fact sheet gives a snapshot of key growth and nutrition indicators for 15-year-olds in 2016 (Younger Cohort) and compares them with those of the Older Cohort at age 15, seven years earlier.

The longitudinal and parallel-cohort structure of the study permits investigation of the changes that have occurred over time, how these have affected children as they grow up, and the effects on the health of adolescents.

We have been able to elucidate some of the possible underlying causes of overweight and obesity. Lack of physical activity and greater consumption of "fast foods" are cited and we have also found that early onset of menarche is associated with overweight and obesity. Younger Cohort children were less likely to be stunted than Older Cohort children but there has been a parallel increase in overweight and obesity, primarily among urban and better-off families.

Key Findings

- Fewer Younger Cohort children were stunted (15%) than the Older Cohort (31%) at the same age.
- In the Younger Cohort there was a marked reduction of stunting between the ages of five (Round 2) and eight (Round 3) consistent with catch-up growth. A further reduction between the ages of 12 (Round 4) and 15 (Round 5) highlights adolescence as a second opportunity for catch-up, a trend also observed among the Older Cohort.
- While differences in stunting between urban and rural children have decreased and the greatest reduction in stunting between 2013 (Round 4) and 2016 (Round 5) has been witnessed among rural settings and poorer households, these groups are still the most likely to be left behind and to be food-insecure.
- Overweight and obesity are increasing. 15-year-olds in 2016 (Younger Cohort) are more likely to be overweight or obese than 15-year-olds in 2009 (Older Cohort), especially in urban areas. Across both cohorts, there is an association between early puberty and later obesity for girls, with increased risk of chronic diseases later in life.
- Compared with the Older Cohort at the same age, the Younger Cohort ate a slightly more diverse diet. Improvements were greatest in the rural areas and in poorer households.

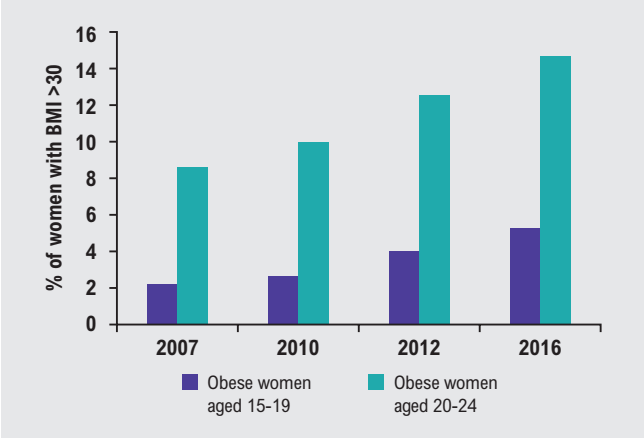
The policy context for growth and nutrition in Peru

Over the period of the Young Lives study (2002-16), Peru has shown significant advances in poverty reduction, evident in reduced stunting in children under five years of age (Figure 1) and an increase in life expectancy from 68 years for those born in 1994-95 (applicable to our Older Cohort), to 71 years for those born in 2001-02 (applicable to our Younger Cohort), and 75 years for those born in 2015 (World Bank). This has been attributed mainly to gross national economic growth with an increase in income per capita and higher wages and, to a lesser extent, to safety-net programmes (World Bank, Morley S).

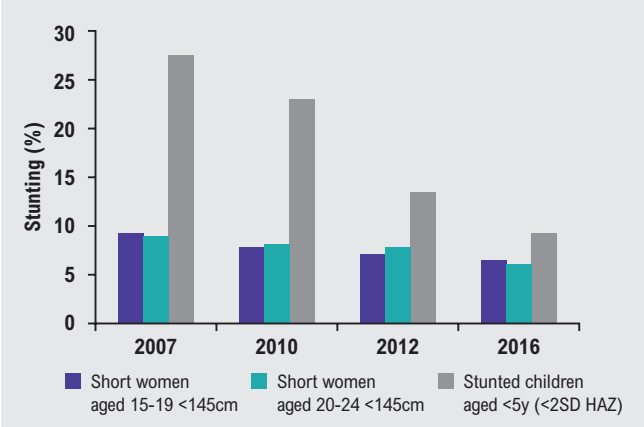
Nationally, while differences between the richest and poorest households have reduced, wealthier children are still less likely to be stunted than those from the poorest households. But there has been an increase in overweight and obesity which threatens the long-term health of this generation and has serious potential economic and social consequences (Figure 1).

Figure 1. *Evolution of obesity and stunting in Peru*

Evolution of obesity in young women in Peru



Evolution of stunting in young women and children <5 years in Peru



Source: Encuesta Demográfica y de Salud Familiar
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Incidence of stunting and thinness

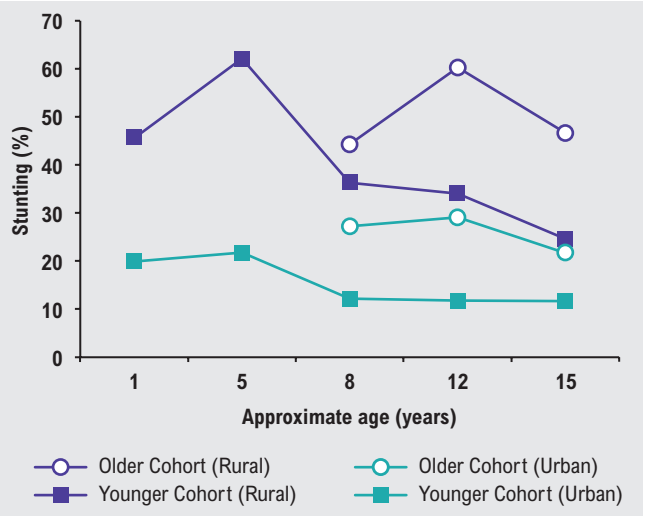
The prevalence of stunting[1] has reduced over the period of the study. This reduction was evident in both males and females, rural and urban settings (Figure 2), and across terciles of wealth, maternal education and ethnicity, and is in keeping with reports of reduced stunting in Peruvian children less than five years old.[2]

The Younger Cohort data also allow us to study how stunting progresses over the life course. Stunting among Young Lives children is evident early on: 29% of Younger Cohort children were stunted at age one, increasing to 37% at age five but showing a reduction in mid-childhood, with only 21% stunted at age eight and 20% at age 12. Round 5 has shown a small overall reduction to 16% at age 15.

Comparison between the two cohorts reveals how this trajectory has changed. For instance, in contrast to the Younger Cohort, stunting among the Older Cohort increased from 35% at age eight, to 43% at age 12, but a large reduction at 15 years of age (to 31%) is suggestive of catch-up growth during puberty in this cohort.

The prevalence of stunting differs by location (Figure 2), being higher in rural than in urban areas at all ages. In the Older Cohort, stunting increased between eight and 12 years of age, especially among rural children. During adolescence, prevalence of stunting decreased in both rural and urban children; the decrease was greater among rural children, but the difference remained. In the Younger Cohort, large differences in the prevalence of stunting by location were already evident at age one, with the gap increasing further by the age of five, with 62% of rural children stunted compared with 22% of urban children. However, after the age of five there was evidence of catch-up growth with a reduction in stunting in mid-childhood and during adolescence. Stunting was less prevalent in children of wealthier households or with better educated mothers but the difference between more and less privileged groups reduced over time (Table 1).

Figure 2. *Evolution of stunting by age, cohort and location*



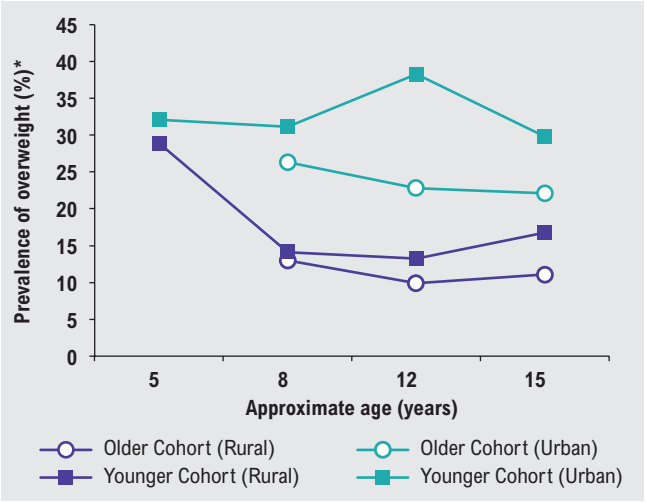
1 Stunting, or prevalence of stunting, is defined as percentage of children having height-for-age z-scores <-2 SD from the median height of a reference population of the same age and gender.

2 Encuesta Demográfica y de Salud Familiar

Incidence of overweight and obesity

Overweight and obesity is not only common in Peru but is increasing. In 2002, 20% of Older Cohort eight-year-olds and 25% of Younger Cohort children at the same age (in 2009) were overweight or obese. In 2006, at the age of 12, 17% of the Older Cohort were overweight or obese; this had increased to 29% in 2013 for the Younger Cohort at the same age. In 2016 this difference remained, with 25% of all Younger Cohort 15-year-olds overweight or obese compared with 17% of the Older Cohort in 2009.

Figure 3. *Evolution of overweight, including obesity, by age, cohort and location*



*BMI Z score >1

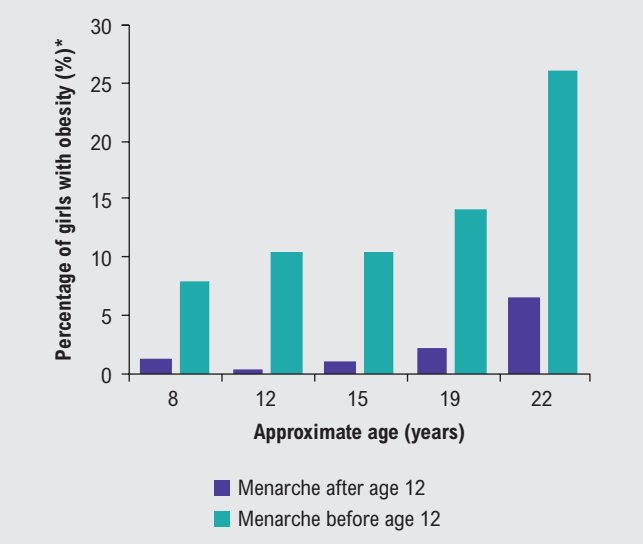
In both cohorts, overweight and obesity were more common in households with better access to water and sanitation, those reporting that they were food-secure, and the urban Spanish-speaking population. Meanwhile, obesity was more common in adolescents from urban, better-off, and better educated families (Table 1).

Overweight and obesity are more common in boys than girls at ages eight and 12. In girls there is a clear relationship, evident in both cohorts, with age at puberty. Younger Cohort girls who had experienced menarche by age 12 (early menarche) were two to three times more likely to be overweight or obese at age 15. The Older Cohort allows us to follow the association between obesity and age of menarche over the life course. Obesity at age eight seemed to predispose girls to early menarche and these girls with early menarche were at greater risk of later overweight and obesity: at age 22, 26% of these young women were obese compared to 7% of 22-year-old girls who had menarche after the age of 12 (Figure 4).

Food security and diversity

About 10% of households in both cohorts experienced food insecurity directly associated with poverty. For instance, 14% of those Older Cohort households falling in the poorest wealth tercile were food-insecure compared to only 4% those households in the highest wealth tercile. Thinness was rare in the survey population but in the Younger Cohort among those households that had been food-insecure, thinness in 2016 was almost double (1.3% as against 0.7%).

Figure 4. *Percentage of Older Cohort girls with obesity by menarche stage*



* Age 8-15y BMI z-score >2SD; Age 19 and 22 BMI>30

Most adolescents ate a diverse diet with foods from five or six of the seven main food groups. Consumption of meat including offal was associated with decreased likelihood of stunting for the Younger Cohort at 15 years old (Round 5; stunting was 16% in the group that consumed meat, as against 21% in the group that did not). At 12 years of age, the effect of eating meat had been more marked (stunting was 17% in the group that ate meat, as against 33% in the group that did not) suggesting that diet at this age had a greater impact on linear growth.

Access to water and sanitation

Access to piped water increased between 2006 (Round 2) and 2009 (Round 3), from 61% to 80% of the Younger Cohort households and from 65% to 88% of the Older Cohort households. Most houses in both cohorts (85% or more) had access to sanitation but stunting was always significantly higher in the relatively few households without access to sanitation. These results suggest that completing access to piped water and sanitation where this is still lacking would further reduce the incidence of stunting.

Conclusions

Comparison between the Older and Younger cohorts demonstrates how the nutrition and growth of children in Peru has improved, with reduced stunting. However, inequality still exists with disadvantages common for those infants and children growing up in rural households without access to clean water and sanitation and with less likelihood of animal-based foods in their diets.

Young Lives has also graphically observed another rapidly worsening threat – the rise of overweight and obesity in children and young adults. This is more common in urban areas and in households with more financial resources. Left unchecked, this phenomenon will lead to an increase in chronic diseases that will in turn put a strain on healthcare resources that could affect the whole country.

Table 1. *Nutritional status of 15-year-old children in Peru*

	Stunting (%)		Obesity (%)		Overweight and obesity (%)	
	2009	2016	2009	2016	2009	2016
Gender						
Female	29.8	18.2	3.6	4.2	20.3	28.6
Male	32.0	14.7	2.7	5.4	14.2	21.2
Gap	2.2	-3.4	-0.9	1.2	-6.1	-7.4
Area of residence						
Rural	42.7	24.6	1.5	1.0	11.1	16.8
Urban	21.7	11.7	4.5	7.0	22.1	29.7
Gap	-21.0	-13.0	3.0	5.9	11.0	13.0
Wealth Index						
Bottom tercile	40.3	23.0	2.7	1.8	14.9	15.0
Middle tercile	26.4	17.4	5.1	4.5	18.6	26.8
Top tercile	11.9	6.9	1.5	9.1	21.7	35.9
Gap	-28.4	-16.1	-1.2	7. 3	6.8	20. 9
Maternal Education						
Primary incomplete or less	40.6	24.1	1.3	1.0	15.9	17.0
Complete primary or secondary	24.1	14.2	5.0	6.4	18.5	27.2
Higher education	7.1	5.8	2.6	7.6	16.0	37.4
Gap	-33.5	-18.3	1.3	6.6	0.0	20.3
Mother's first language (ethnicity proxy)						
Indigenous	44.4	23.9	0.4	1.9	11.6	17.8
Spanish	21.3	12.5	4.7	6.3	21.0	28.7
Gap	-23.1	-11.4	4.2	4.5	9.4	11.0
Access to piped water in 2006						
No	39.5	22.4	4.4	2.7	12.7	18.6
Yes	23.4	12.2	2.1	6.3	21.2	29.5
Gap	-16.2	-10.2	-2.3	3.6	8.6	10.9
Access to piped water in 2009						
No	34.1	25.4	2.1	3.3	22.2	18.3
Yes	30.4	14.0	3.4	5.2	16.5	26.8
Gap	-3.8	-11.4	1.3	2.0	-5.8	8.6
Access to sanitation in 2006						
No	40.7	22.8	4.3	2.2	17.0	14.5
Yes	28.7	15.3	2.9	5.3	17.3	26.9
Gap	-12.1	-7.6	-1.4	3.1	0.3	12.4
Access to sanitation in 2009						
No	50.4	24.6	6.3	4.2	15.4	19.5
Yes	29.2	15.7	2.9	4.8	17.4	25.5
Gap	-21.2	-8.9	-3.4	0.7	2.0	6.0
Food insecure in 2009						
No	30.8	15.8	3.5	4.9	17.3	25.4
Yes	31.8	23.6	0.0	3.7	16.8	20.7
Gap	1.0	7. 8	-3.5	-1.2	-0.5	-4.7
All children	30.9	16.5	3.2	4.8	17.3	24.9
Number of children	537	1,708	537	1,708	537	1,708

Notes: Gaps are percentage points. Gaps calculated using female, indigenous, rural, incomplete primary or less, and poorest quintile as baseline. Information on maternal education and language was taken from 2006 (Round 2). Area of residence refers to the household location in 2002 (Round 1). Household wealth terciles were calculated separately for each cohort using the household wealth index of 2002 (Round 1).

REFERENCES AND FURTHER READING

Aurino, E., Fernandes, M., and Penny, M. E. (2016) 'The nutrition transition and adolescents' diets in low- and middle-income countries: a cross-cohort comparison'. *Public Health Nutrition*, 380(9859), 1–10. doi.org/10.1017/S1368980016001865

Dearden K. A., Schott W., Crookston B. T., Humphries D. L., Penny M. E., and Behrman J.R.(Young Lives Determinants and Consequences of Child Growth Project Team). (2017) 'Children with access to improved sanitation but not improved water are at lower risk of stunting compared to children without access: a cohort study in Ethiopia, India, Peru, and Vietnam'. *BMC Public Health* 23;17(1):110. doi.org/10.1186/s12889-017-4033-1

Georgiadis A., Benny L., Le Thuc, Galab S., Reddy P., and Woldehanna T. (2017) 'Growth recovery and faltering through early adolescence in low- and middle-income countries: Determinants and implications for cognitive development'. *Social Science & Medicine* 179; 81-90.

Morley, S. (2017) 'Changes in rural poverty in Peru 2004-2012'. *Latin American Economic Review* 26 (1) https://doi.org/10.1007/s40503-016-0038-x

Penny, M., Jimenez, M. M., and Marin, R. M. (2016) 'Early rapid weight gain and subsequent overweight and obesity in middle childhood in Peru'. *BMC Obesity,* 3(1), 55. Doi.org/10.1186/s40608-016-0135-z

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