

Introduction to the double burden of undernutrition and excess weight in Latin America^{1–3}

Juan A Rivera, Lilia S Pedraza, Reynaldo Martorell, and Angel Gil

The satellite symposium titled “The Double Burden of Undernutrition and Obesity in Latin America: Where Do We Stand and Where Do We Go?” was presented at the International Union of Nutritional Science (IUNS) 20th International Congress of Nutrition, “Joining Cultures through Nutrition,” held in Granada, Spain, 15–20 September 2013, and hosted by the Spanish Society of Nutrition (SEN).

The symposium, chaired by Juan Rivera [National Institute of Public Health, Mexico (INSP)] and Eduardo Atalah (University of Chile, Santiago, Chile), aimed at documenting the coexistence of undernutrition and obesity at the individual, household, and country levels and the degree to which nutrition programs and policies take into account the double burden within their scope and objectives in 11 Latin American countries.

The participants presented results from Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela; 7 of them completed a final manuscript describing their country’s situation (1–7). The participation of the investigators was cosponsored by DSM Nutritional Products, the IUNS 20th International Congress of Nutrition, and the authors’ own institutions. The publication of the articles was funded by the Division of Social Protection and Health of the Inter-American Development Bank, Washington, DC.

The prevalence of stunting and of overweight and obesity (OW/OB) in children <5 y as well as the prevalence of OW/OB in women are shown in **Table 1**. Chile has the lowest prevalence of stunting (~1.9%), lower in fact than in the WHO standards (2.3%), whereas Guatemala has the highest prevalence (48%) followed by Ecuador (25.3%). Colombia, Mexico, and Uruguay have prevalences ranging between 10% and 14%, and Brazil has a prevalence of ~7%. Prevalences of excess body weight >7% in children <5 y are found in Chile, Uruguay, Mexico, Ecuador, and Brazil, whereas prevalences in Guatemala and Colombia are lower. The prevalence of OW/OB in women for different age subgroups ranged between 40.6% and 84.1%. The highest prevalences were found in Mexico and the lowest in Colombia and Guatemala. Statistics are not provided for Chile, but other publications report a high prevalence of OW/OB in women (8, 9).

The double burden of malnutrition was estimated by each country following a common framework (10) provided by the symposium coordinators. The percentage of households with a stunted child and an overweight or obese mother, referred to as the prevalence of the double burden at household level, is shown in **Table 2**. Prevalence estimates ranged from 20% in Guatemala to 13.1% in Ecuador, 8.4% in Mexico, 6.3% in Uruguay, 5.1% in

Colombia and 2.7% in Brazil. To assess if the coexistence or joint prevalence of the 2 conditions was solely the result of the independent occurrence of each one of them, we compared the observed prevalence of the double burden with the expected prevalence under the assumption that the 2 conditions are uncorrelated. In 5 of 6 countries (Brazil, Colombia, Ecuador, Guatemala, and Mexico), the observed double burden prevalence was significantly lower than the expected value, indicating lower risk of stunting in children <5 y or of overweight or obesity in women in households in which the other condition was present. In Uruguay, the observed and expected values were not significantly different. In all cases, differences between observed and expected prevalences were small.

The prevalence of the double burden of overweight and anemia (or zinc deficiency in Ecuador) at the individual level in pre-school- or school-aged children ranged from as low as 1.2% in Brazil to 8.4% in Ecuadorian children <5 y (Table 2). In 3 of 5 countries with available information, prevalences were lower than expected ($P < 0.05$) under the assumption of independent occurrence of the 2 conditions; in Brazil, the observed and expected values were not significantly different ($P > 0.05$), whereas in Ecuador the observed prevalence was higher than expected ($P < 0.05$). However, as was the case at the household level, all differences were small.

The prevalence of the double burden of overweight and anemia at the individual level in women ranged from 3.4% to 13.6% (Table 2). Brazil presented the highest prevalence (13.6%) followed by Guatemala (11.7%). Other countries had prevalences between 3.4% and 8.9%. In 2 of 5 countries, observed prevalence rates were lower than expected ($P < 0.05$); in one (Mexico) the observed prevalence was higher than expected ($P < 0.05$); and in 2, observed and expected prevalence rates were not signifi-

¹ From the Center for Nutrition and Health Research, National Institute of Public Health, Cuernavaca, Morelos, Mexico (JAR and LSP); the Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA (RM); and the Institute of Nutrition and Food Technology, Biomedical Research Centre, University of Granada, Granada, Spain (AG).

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³ Address correspondence to JA Rivera, Center for Nutrition and Health Research, National Institute of Public Health, Cuernavaca, Morelos 62100, Mexico. E-mail: jrivera@insp.mx.

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TABLE 1
Prevalences of stunting, OW/OB, and anemia in children <5 y of age and women in Latin America¹

| Country | Children | | | | | | Women | | | | | | | | | |
|-----------|-------------------------|---------|---------|--------------------------|-----------------------|------------------------|-------------------------|--------|---------|-----------------------|--------------------|-----------------------|-------------------------|--------|--------|------------------------|
| | Year of data collection | Age, y | n | Stunting, ² % | OW/OB, ³ % | Anemia, ³ % | Year of data collection | Age, y | n | OW/OB, ⁴ % | OB, ⁵ % | OW/OB, ⁶ % | Year of data collection | Age, y | n | Anemia, ⁶ % |
| Brazil | 2006–2007 | <5 | 20,395 | 7.1 | 7.3 ⁷ | 21.8 | 2008–2009 | ≥20 | 188,488 | 48.0 | 16.9 | 64.9 | 2006–2007 | ≥20 | 20,395 | 30.6 |
| Chile | 2011 | <1 | 356,972 | 2.3 | 7.6 ⁸ | NA | NA | 15–24 | NA | NA | 12.5 | NA | 2011 | 15–24 | 404 | 5.7 |
| Chile | 2011 | 1 to <4 | 346,367 | 1.9 | 9.4 ⁸ | NA | NA | 25–44 | NA | NA | 28.3 | NA | 2011 | 25–44 | 985 | 4.5 |
| Chile | 2011 | 4 to <6 | 303,523 | 1.4 | 12.9 ⁸ | NA | NA | 45–64 | NA | NA | 44.8 | NA | 2011 | 45–64 | 975 | 4.4 |
| Colombia | 2010 | <5 | 17,696 | 13.2 | 5.2 ⁷ | 27.5 | 2010 | 18–64 | 50,823 | NA | NA | 55.2 | 2010 | 18–29 | 9314 | 6.6 |
| Colombia | — | — | — | — | — | — | — | — | — | — | — | — | 2010 | 30–49 | 9314 | 10.3 |
| Ecuador | 2012 | <5 | 8894 | 25.3 | 8.6 ⁷ | 25.7 | 2012 | ≥20 | 18,909 | 38.3 | 28.1 | 66.5 | 2012 | 20–40 | 8014 | 15.4 |
| Guatemala | 2008 | <5 | 10,178 | 48.0 | 4.9 ⁸ | 49.2 | 2008 | 15–34 | 10,576 | 29.0 | 11.7 | 40.6 | 2008 | 15–34 | 11,381 | 24.5 |
| Guatemala | — | — | — | — | — | — | 2008 | 35–49 | 4694 | 39.8 | 30.0 | 69.8 | 2008 | 35–49 | 4756 | 29.0 |
| Mexico | 2012 | <5 | 10,658 | 13.6 | 9.0 ⁸ | 23.3 | 2012 | 20–39 | 9866 | 34.4 | 30.7 | 65.1 | 2012 | 20–39 | 8774 | 11.9 |
| Mexico | — | — | — | — | — | — | 2012 | 40–59 | 7902 | 37.3 | 46.8 | 84.1 | 2012 | 40–59 | 3960 | 16.2 |
| Uruguay | 2011 | <2 | 2994 | 10.9 | 9.5 ⁷ | 31.5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

¹NA, no available data; OB, obesity; OW, overweight; OW/OB, overweight and obesity.

²Height-for-age z score < 2.

³Hemoglobin <11 g/dL.

⁴BMI (in kg/m²) ≥25.

⁵BMI ≥30.

⁶Hemoglobin <12 g/dL.

⁷BMI-for-age >2 z scores.

⁸Weight-for-height >2 z scores.

TABLE 2

Prevalences of the double burden of malnutrition at the household (child <5 y of age with stunting and mother with OW/OB) and individual (children with OW and micronutrient deficiency or women with OW/OB and micronutrient deficiency) levels in Latin America¹

| Country | Household level | | | Children | | | Women | | | | |
|----------------------|-------------------------|--------|---|----------|--------|-----------------------|---|--------|--------|-----------------------|---|
| | Year of data collection | n | Observed prevalence of double burden, % (expected prevalence) | Age | n | Type of double burden | Observed prevalence of double burden, % (expected prevalence) | Age, y | n | Type of double burden | Observed prevalence of double burden, % (expected prevalence) |
| Brazil | 2006–2007 | 4390 | 2.7 (3.1) ² | <5 y | 3012 | OW + anemia | 1.2 (1.3) ³ | 15–49 | 1955 | OW/OB + anemia | 13.6 (13.5) ³ |
| Colombia | 2010 | 10,317 | 5.1 (6.9) ² | 5–12 y | 7178 | OW + anemia | 1.4 (1.5) ² | 13–49 | 6604 | OW/OB + anemia | 3.4 (3.5) ² |
| Ecuador | 2012 | 8078 | 13.1 (14.3) ² | 5–11 y | 4395 | OW + zinc deficiency | 8.4 (8.1) ⁴ | 12–49 | 8014 | OW/OB + anemia | 8.9 (8.8) ³ |
| Guatemala | 2008 | 9320 | 20.0 (22.9) ² | 6–59 mo | 8891 | OW + anemia | 1.4 (1.6) ² | 15–49 | 15,049 | OW/OB + anemia | 11.7 (12.7) ² |
| Mexico | 2012 | 4777 | 8.4 (9.1) ² | 5–11 y | 13,679 | OW + anemia | 2.9 (3.4) ² | 15–49 | 17,924 | OW/OB + anemia | 7.46 (7.2) ⁴ |
| Uruguay ⁵ | 2004 | 1532 | 6.3 (7.0) ³ | NA | NA | NA | NA | NA | NA | NA | NA |

¹Differences between observed and expected prevalences were obtained by chi-square test by the authors of each article. NA, no available data; OB, obesity; OW, overweight.

²Observed vs. expected prevalences significantly lower, $P < 0.05$.

³Observed vs. expected prevalences not significantly different, $P > 0.05$.

⁴Observed vs. expected prevalences significantly higher, $P < 0.05$.

⁵In the Uruguay data, the double burden pair at the household level considers children <6 y.

cantly different ($P > 0.05$). Again, the differences were small and probably of little practical importance.

In summary, in only 2 of 16 comparisons, observed prevalence rates were higher than expected, whereas 10 were lower than expected and 4 were not significantly different. Moreover, in the 2 cases in which the observed prevalence of double burden was higher than expected, the absolute differences were very small (0.4 and 0.3 percentage points). Also, in most of the cases in which the observed prevalence estimates were lower than expected (8 of 10), differences were <1.5 percentage points and therefore were not considered important in public health terms. This indicates that, contrary to expectations, the double burden is either lower or equal to expected values (with only 2 exceptions in which differences were very small). We conclude that our expectation of an association between the risks of undernutrition and excess body weight did not hold. On the other hand, despite the high number of comparisons in which observed values were lower than expected, in most cases differences were too small to be considered of practical significance and therefore we cannot conclude that the risks of undernutrition and excess body weight are negatively related.

Although undernutrition and excess body weight risks seem to be largely unrelated at the individual and household levels, the fact remains that both types of conditions are very common in Latin American countries: overweight and obesity coexist with undernutrition (either stunting, anemia, or zinc deficiency) at the national level. The prevalence of obesity in women is high in all countries, the prevalence of anemia in children and women is also high in most countries, and the prevalence of stunting is medium to very high in the majority of the countries studied. The coexistence of the double burden at the household and individual levels was also documented in most countries. As a result of the high prevalences of the 2 conditions, the joint prevalence or co-occurrence of the double burden is common. It is therefore clear that the double burden does exist in Latin American countries.

These findings evidently indicate the need of policies and programs to tackle both conditions simultaneously in a coordinated fashion. The articles in this supplement issue show that all countries have in place programs aimed at preventing undernutrition and that most countries are in the process of implementing obesity prevention as part of the policy agenda. There is evidence in the literature that cash transfers or food distribution programs may result in increased energy intake at the household level (11). This has led to concerns about the possible contribution of these programs to obesity in populations who are not energy deficient and supports the need to include obesity prevention strategies as an essential component of cash or food transfer programs in countries with the double burden of malnutrition. Only one country (Mexico) reported that its main undernutrition prevention program “Oportunidades” is in the process of scaling up a strategy based on individual counseling, which promotes breastfeeding and healthy complementary feeding and emphasizes the importance of promoting linear growth and avoiding excessive weight gain in preschool-aged children. Oportunidades also includes obesity and non-communicable disease prevention in adults. However, given the importance of obesity-promoting environments as determinants of obesity (12), in addition to including obesity prevention strategies as part of the cash or food transfer programs, governments should implement regulations and policies aimed at

promoting healthy food environments and physical activity (13). Moreover, the program has modified the food supplements distributed, reducing energy to avoid weight gain in subgroups at risk of obesity. However, undernutrition and obesity prevention strategies are not integrated in the region. The coexistence of the conditions indicates the need to reformulate policies and programs around the notion of “healthy eating” and “healthy lifestyles,” including the promotion of physical activity during the different phases of the life course, in a region in which most countries are still not tackling both conditions simultaneously.

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