

effect. The reduction of the sample size from 24 242 to 13 818 records for women and from 10 058 to 4619 records for children is responsible for the observed widening of the confidence intervals, and the loss of statistical significance for the observed differences (Table SII in appendix).

The analysis of compliance using both the individual- and district-level data shows that significantly more participants exposed to Juntos or living in Juntos districts complied with conditions for staying in the programme. Among children, the prevalence ratios for having been born at a health centre were 1.23 (95%CI: 1.15–1.31) and 1.18 (95%CI: 1.07–1.31), and for having checkups were 1.27 (95%CI: 1.22–1.32) and 1.27 (95%CI: 1.19–1.34), in the individual and district level analyses, respectively. In the case of vaccination, the prevalence ratio for receiving BCG in the individual level analysis was 1.06 (95%CI: 1.03–1.08) and in the district level analysis was 1.08 (95%CI: 1.03–1.13). At the individual and district levels, the prevalence ratios for the other vaccines were: 1.08 (95%CI: 1.06–1.11) and 1.05 (95%CI: 1.02–1.08) for DPT 1 (2 months), 1.13 (95%CI: 1.10–1.17) and 1.08 (95%CI: 1.03–1.12) for DPT 2 (4 months), 1.07 (95%CI: 1.05–1.10) and 1.06 (95%CI: 1.02–1.10) for polio 2 (4 months), 1.21 (95%CI: 1.16–1.26) and 1.13 (95%CI: 1.07–1.19) for DPT 3 (6 months), 1.17 (95%CI: 1.12–1.21) and 1.13 (95%CI: 1.08–1.19) for polio 3 (6 months), and 1.10 (95%CI: 1.06–1.13) and 1.07 (95%CI: 1.03–1.11) for measles (12 months).

## Discussion

This is the first study to demonstrate an impact of Juntos, a CCT in Peru, on maternal health outcomes. It is also the first to explore the effect of the programme on childhood anaemia, acute malnutrition and complications after delivery. This study demonstrates that among residents of Juntos districts that fulfil the criteria for participation in this programme, actual participation was associated with lower frequency of underweight in mothers and anaemia in children. A marginally significant reduction of anaemia was also found in mothers. Additionally, we demonstrated that when comparing eligible residents of Juntos districts with eligible residents of districts that were not included in Juntos, mothers in

intervention districts had a lower prevalence of overweight, and children from those districts had less acute malnutrition and anaemia. A marginally significant reduction of underweight among mothers was also observed. Previous qualitative studies showed that participation in this programme improved the quality of the food they purchased (Perova & Vakis 2009b; Segovia 2011). Several studies have demonstrated that CCT programmes improve maternal nutrition in other countries (Mason *et al.* 2012). In addition, improvements in women's nutrition can result in improvements in birth outcomes (Mason *et al.* 2014). The observed lack of an effect of the programme on underweight among women at the district level could be because of the limited penetration of the programme, with coverages ranging from 39.2% to 57.6%, in the eligible population. We decided not to exclude pregnant women because it is an inclusion criterion for Juntos. The proportion of women that are pregnant is slightly lower for exposed women, both at the individual (5.3% vs. 6.9%) and district level (5.2% vs. 5.8%). These differences could therefore not explain why the observed prevalence of underweight is lower with Juntos (they would produce a difference in the other direction).

Regarding overweight, no effect of the programme was found in the individual analysis. However, there was an effect in the district level analysis. This inconsistency may be explained by a lower prevalence of overweight in target districts observed before the implementation of the programme. Data from Peru show that the prevalence of overweight is higher in the female population not in poverty (Álvarez-Dongo *et al.* 2012).

In the case of anaemia in women, there was no effect of the programme in the individual or district-level analyses. Juntos could prevent anaemia by requiring pregnant women to attend antenatal visits where iron supplementation is provided (Abdullahi *et al.* 2014). As a small proportion (6.1% for the individual level and 5.5% for the district level analyses) of the women included in this study were pregnant, the effect of antenatal visit attendance was probably diluted.

The observed reduction of anaemia in children in the individual-level analysis could result from the required health checkups, where iron supplementation is provided (Dirección General de salud de las Personas