We sometimes forget that an individual is born at conception and not at delivery.

**Key insights**
The most widely investigated mechanisms of the fetal programming of obesity-adiposity and non-communicable diseases (NCDs) are maternal-fetal nutrition and metabolism. The maternal nutritional status, deranged metabolism, infections, maternal stress and environmental factors have a major influence on fetal growth and programming. In this respect, the periconceptional, intrauterine and postnatal periods are the most influential in programming the health status of the following generation.

**Current knowledge**
The regulation of gene expression and function depends not only on the inherited DNA sequence, but also on the differential regulation of genes by environmental factors at different times in the life course of an individual. The main mechanisms involved in this process are DNA methylation, which has a 'silencing' effect on gene transcription, chemical modifications of histones, which alter chromatin structure and transcription, and miRNAs, which interfere with mRNA translation. The risk of obesity-adiposity-related NCDs is profoundly influenced by intrauterine and postnatal environmental modifications of the epigenome.

**Practical implications**
The identification of these regulatory mechanisms reveals modifiable components in the intergenerational transmission of health and disease. This offers potential means for curtailing the epidemic of NCDs worldwide. Both undernutrition and overnutrition contribute to NCDs, and in developing countries that are undergoing rapid socioeconomic and nutritional transition, the two cycles may operate sequentially within one lifetime, producing even more detrimental effects. Given the difficulty in implementing long-term lifestyle modifications in adults, an attractive alternative is to influence the lifestyle of young girls and pregnant women in the relatively short window of the periconceptional and gestational periods.

**Recommended reading**