# Overweight and Obesity in Low- and Middle-Income Countries

There is a double burden of malnutrition in low- and middle-income countries (LMIC)—with challenges for both undernutrition and overweight/obesity. Trends of increasing overweight and obesity hinder progress on maternal and infant health, which also has important implications for future economic development. Maternal overweight and obesity are associated with maternal morbidity, preterm birth and increased infant mortality (Black et al, 2013). In 1990, obesity-related disability-adjusted life years in LMIC were estimated to be 518 per 100,000 people; by 2010, this figure had risen 90 percent, to affect 985 per 100,000 people (Dobbs et al, 2014). As well, between 2006 and 2015, the cost of lost economic productivity due to obesity-related cardiovascular disease and diabetes in LMIC was estimated to be US$84 billion (Abegunde et al, 2007). Understanding the current global status of overweight and obesity will be vital for addressing the double burden of malnutrition.

Maximising the Quality of Scaling Up Nutrition (MQSUN) is funded through the United Kingdom's (UK) Department for International Development (DFID) and provides evidence-based technical expertise to DFID country offices and the Scaling Up Nutrition (SUN) Movement for the design and implementation of effective multisectoral nutrition programming and policies.

In 2015, MQSUN conducted a targeted review of the current research on maternal and child overweight and obesity to understand the current situation in low- and middle-income countries (LMIC); identify recent trends and context-specific risk factors to better understand how to prevent overweight and obesity; and to identify entry points for leveraging existing undernutrition programmes to prevent overweight and obesity in LMIC.

« Strategies and evidence-based action to address both undernutrition and overweight and obesity are urgently needed. »

To identify relevant trends and risk factors, MQSUN analysed Demographic and Health Survey (DHS) data on overweight and obesity amongst women and children for most countries, and data from the Global Burden of Disease Study for countries for which DHS data were not available. Additionally, MQSUN developed a conceptual framework highlighting key policies, programmes and interventions that could be prioritised to address overweight and obesity in LMIC. Lastly, MQSUN identified research gaps that should readily be addressed to support evidence-based policy and programming for the double burden of malnutrition.

# Trends, Risk Factors and Key Findings

## Trends

Recent trends demonstrate that economic development, urbanisation and globalisation of the food system have caused changes in diet and physical activity and are key drivers of the global obesity epidemic (Popkin, Monteiro & Swinburn, 2013; Swinburn et al, 2011; Gupta et al, 2012). Table 1 summarises the key overweight and obesity trends identified during this review. Whilst demographic factors such as gender, age and urban residence have clear relationships with the prevalence of overweight and obesity, the link between socioeconomic factors like wealth and education—for both women and children—are less consistent across LMIC.

**Table 1. Key Overweight and Obesity Trends.**

| Trend | Finding |
|---|---|
| *Global burden of overweight and obesity* | **Global burden** of obesity and overweight (International Food Policy Research Institute [IFPRI], 2016) is a growing problem amongst women and children in LMIC. Notably, women are at a much greater risk of overweight and obesity compared to men. |
| *Double burden of malnutrition* | **Double burden of malnutrition:** Wasting, stunting and micronutrient deficiencies persist in low-income countries, combined with rising overweight and obesity (IFPRI, 2016). |
| *Child under five overweight and obesity* | **Overweight children under five years in select countries:** Malawi, Mozambique, Nigeria, Rwanda and Zambia have a prevalence of overweight greater than 7 percent (Tzioumis et al, 2016), which is the global nutrition target for childhood overweight set by the World Health Organization (WHO, 2014). |
| *Adolescent overweight and obesity* | **Increasing prevalence of adolescent overweight and obesity:** Trend data indicate that overweight and obesity prevalence in adolescent girls is increasing over time in many countries (Jaacks, Slining & Popkin, 2015a), and the rate is proportionately higher in urban areas compared to rural areas. |
| *Rural overweight and obesity* | **Lower rural overweight:** The prevalence of overweight and obesity is lower in rural areas compared with urban areas in most LMIC. However, the prevalence rates for women in many LMIC are still between 25 and 30 percent (Jaacks, Slining & Popkin, 2015b).<br>**Recent increase in rural overweight and obesity in several countries:** Looking at trends over time, the recent rate of increase in overweight and obesity in several countries (e.g., Burkina Faso, Kenya, Uganda and Zimbabwe) is greater in rural areas compared to urban areas (Jaacks, Slining & Popkin, 2015a). |
| *Urban overweight and obesity* | **Increasing urban overweight and obesity:** Prevalence in urban areas of countries like Ghana, Kenya, Niger, Sierra Leone, Tanzania and Zimbabwe is approaching 50 percent (Jaacks, Slining & Popkin, 2015b). In some sub-Saharan African countries, the urban poor are experiencing the greatest increases in overweight and obesity (Ziraba, Fotso & Ochakom, 2009). The current trend indicates the prevalence of overweight and obesity in urban areas will increase by 10 percent over the next decade* (Jaacks, Slining & Popkin, 2015b). |

** Including Bangladesh, Ghana, Malawi, Nepal, Niger, Rwanda, Zambia and Zimbabwe.*

*Source: Jaacks L, Kavle J, Perry A, Nyaku A. Programming maternal and child overweight and obesity in the context of undernutrition: current evidence and key considerations for low- and middle-income countries. Public Health Nutrition. 2017;20(7);1286–96.*

## Risk Factors and Key Findings

Several risk factors exist for overweight and obesity for vulnerable populations living in LMIC: (1) maternal nutrition and appropriate gestational weight gain; (2) infant and young child nutrition and healthy growth trajectories; (3) value and social standing; (4) time and effort for food preparation; and (5) cultural beliefs about body size. Table 2 summarises the key findings in regard to the causes of overweight and obesity in LMIC.

**Table 2. Risk Factors, Key Findings and Programme Implications of Overweight and Obesity in Low- and Middle-Income Countries.**

| Risk Factor | Findings | Programme Implications and Research Gaps |
|---|---|---|
| Cultural beliefs about body size | Cultural beliefs about body size may be a key barrier to programmes aimed at preventing overweight and obesity | Integrate cultural beliefs about body size into programme planning<br>*Further research is needed to understand cultural beliefs about weight* |
| Food preparation time and effort | Increase in women's participation in the workforce decreases time for food preparation and quality of foods consumed (i.e., more consumption of processed, junk, fast and restaurant foods)<br>In low-income households, cost of nutritious foods is also a barrier<br>Adolescents taking care of young siblings more regularly contributes to the consumption of unhealthy foods | Consider women's time constraints and include 'do no harm' when designing nutrition programmes<br>*Further research is needed on the impact of women entering the workforce on their and their infants' and young children's weight* |
| Infant and young child feeding | Adequate birth weight and growth in the first two years of life may be protective for obesity later in life<br>Excessive weight gain during infant years can increase risk of obesity later in life<br>Rapid growth catch-up following growth faltering is likely to outweigh negative effects on adult obesity | Integrate IYCF counselling about weight gain into nutrition programmes, especially during antenatal and postnatal care; monitor birth weights, growth and growth faltering<br>*Further research is needed on protective effects of breastfeeding and obesity and the relationship between breastfeeding and overweight* |
| Maternal nutrition | Maternal obesity and weight gain are associated with child obesity | Train providers in maternal nutrition on dietary counselling for women and families during routine growth monitoring visits for pre-conception, in preparation for pregnancy and during antenatal care; train providers to monitor excessive and/or rapid weight gain |
| Value and social standing | Few studies examine the drivers of food choice<br>Processed, fast and restaurant foods are more valued as a result of media advertising and social norms | Promote family nutrition education about processed, restaurant, fast and junk foods |

### Maternal Nutrition

In terms of maternal nutrition, maternal obesity and excess gestational weight gain have been associated with increased child obesity and is an important research gap (Poston, 2012).

### Infant and Young Child Nutrition and Growth

*PATH/Evelyn Hockstein*

Foetal growth and growth within the first two years of life are important predictors of adult weight (Darnton-Hill, Nishada & James, 2004). A meta-analysis of postnatal growth reported an 84 percent increase in risk of obesity at ten years of age with weight gain during infant years (Ong & Loos, 2006). Rapid weight gain and rapid increase in linear growth in children were associated with increased risk of being overweight as an adult (Adair et al, 2013). However, improved *birth weight* (and therefore foetal growth), and growth in the first two years of life, may be protective against overweight later in life by building adult lean body mass (Victoria et al, 2008). The adverse consequences of growth faltering in early life on adult height are well known, and rapid 'catch-up growth' during this period is likely to outweigh any negative effects on adult obesity (Li et al, 2003; Adair et al, 2013). Despite the strong evidence supporting other benefits of breastfeeding, a research gap exists on protective effects of breastfeeding on obesity in developed countries and whether any relationship between breastfeeding and overweight exists in LMIC (Casazza, Fernandez & Allison, 2012). Finally, limited data reveal poor complementary feeding practices with energy-dense, nutrient-poor foods.

### Food Preparation Time and Effort

After women enter the workforce, their time to prepare food becomes limited. Often times, they eat and feed their children junk food because it is convenient and easy to prepare. In addition, when mothers go to work, older siblings often care for younger children and play an important role in feeding young children when mothers are away from home (Kavle et al, 2015). In urban settings, women increasingly have sales and service jobs, which is linked to limited time and increased inactive time, resulting in overweight and obesity (Espeut et al, 2016). Further research is needed in LMIC that focuses on the impact of women entering the workforce on their weight and on potential impact pathways such as a lack of physical activity, increased stress, time pressures and economic independence.

### Value and Social Standing

Few studies have explored the drivers of food choice in LMIC. Processed foods are often perceived as 'higher value' based on mass media's advertising of these foods for healthy growth and development of children (Daivadanam et al, 2015). The value placed on these foods often pressures women to spend more money on these foods they often cannot afford. In many countries, restaurant foods or fast foods were considered better than less-expensive, home-prepared foods, and those who ate this food were perceived as having a higher social standing (Daivadanam et al, 2015; Akpan & Ekpenyonh, 2013).

### Cultural Beliefs

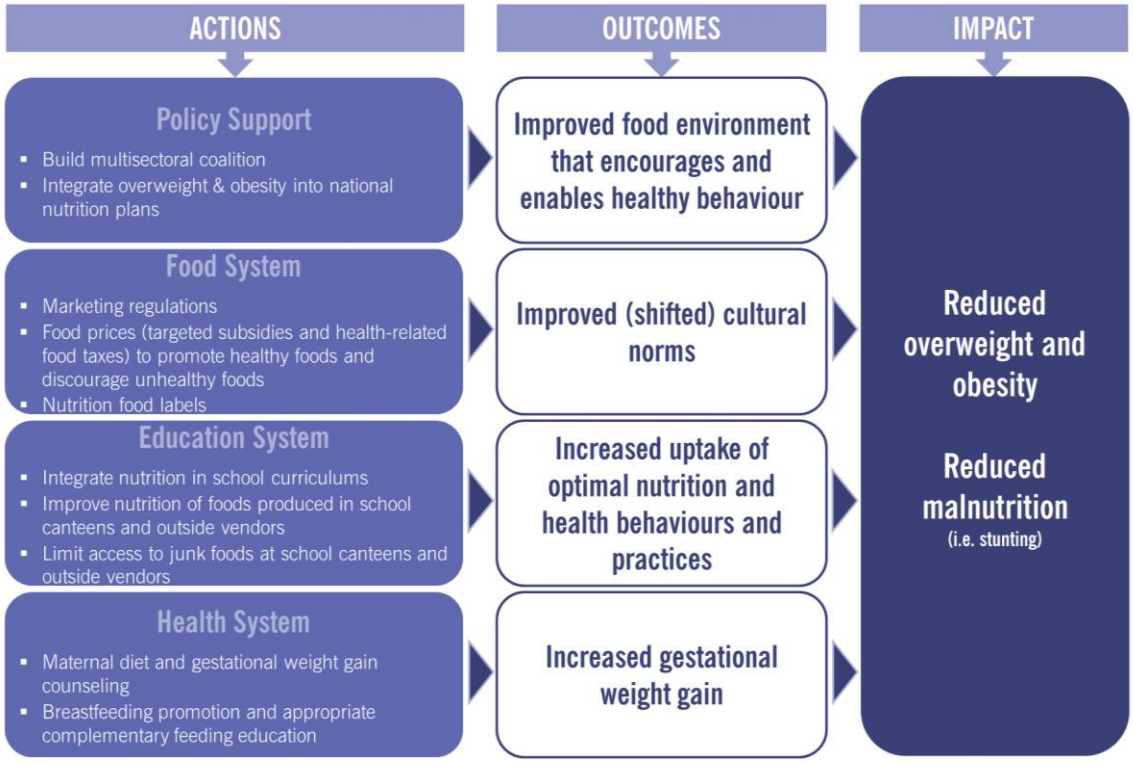
Cultural beliefs about body size vary across countries. Cultural beliefs about body size may be a key barrier to programmes aimed at preventing overweight and obesity. In some sub-Saharan African countries, such as Nigeria, obesity is perceived as a sign of 'power, respect and an evidence of good living' (Akpan & Ekpenyonh, 2013). Further research is needed to understand cultural beliefs about weight, especially in areas with high HIV and AIDS prevalence, as a stigma may be attached to thinness within these contexts (Kruger et al, 2005).

# Entry Points to Integrate Overweight and Obesity Prevention

This review identified four promising entry points to integrate overweight and obesity prevention into ongoing undernutrition programming and services. First, on the policy and enabling environment level, it is essential to integrate prevention into national nutrition plans. Secondly, to integrate overweight and obesity prevention into food systems, the best entry point is existing policies in food and beverage marketing regulations on the marketing of breastmilk substitutes and promotion of healthy diets through the WHO recommendations on marketing of food and beverages to children. Through education systems, nutrition can be easily integrated into school curricula and high-quality (nutrient-dense) foods can be provided through school feeding programmes. Finally, maternal diet (including appropriate gestational weight gain) and IYCF counselling/social and behaviour change communication can easily be integrated into health services. Another important point of entry within the health system is through existing health promotion-based interventions, such as complementary feeding interventions for infants and young children.

In summary, food, education and health systems can all be leveraged to integrate the prevention of overweight and obesity into existing services and/or programmes. The overweight and obesity conceptual framework in Figure 1 highlights the key actions and resulting outcomes that can be prioritised to reduce overweight and obesity in addition to other forms of malnutrition in LMIC.

**Figure 1. Overweight and Obesity Conceptual Framework.**




*Source: Jaacks L, Kavle J, Perry A, Nyaku A. Programming maternal and child overweight and obesity in the context of undernutrition: current evidence and key considerations for low- and middle-income countries. Public Health Nutrition. 2017;20(7);1286–96.*

*WHO's Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020 (2013), Population-Based Approaches to Childhood Obesity Prevention (2012), and Interventions on Diet and Physical Activity: What Works (2009) were consulted when developing the conceptual framework.*

## Policy Support

The first essential entry point is integration of overweight and obesity into national nutrition plans. Programme managers and policymakers in LMIC should assess the situation, and then build awareness and advocacy for nutrition through a multisectoral SUN technical working group. Then, they should take the time to understand how to address the problem. Finally, targeted social and behaviour change communication messages and a targeted multisectoral 'overweight and obesity implementation plan' should be developed (Roberto et al, 2015).

*PATH/Amy MacIver*

## Food System

In the food system, the introduction of policies that reduce the marketing of foods high in saturated fat, trans fat, free sugars or salt to children is likely to be one of the most cost-effective interventions available to governments to address obesity (WHO, 2012; WHO, 2006). In addition, food policies that promote fruit and vegetable production and consumption or food-based dietary guidelines that address micronutrient deficiencies can also prevent overweight and obesity (Lachat et al, 2013). Another recommendation is to promote nutrition labelling as a policy tool for addressing unhealthy food environments (WHO, 2012). The NOURISHING framework developed by World Cancer Research Fund International is a tool that policymakers can use for guidance to develop policies to promote healthy diets and discourage unhealthy diets (Hawkes, Jewell & Allen, 2013).

## Education System

Through the education system, school-based interventions have the potential to improve diet and physical activity whilst decreasing body weight. The review found that schools offer an entry point that is a unique opportunity to change norms around nutritional practices and healthy body weights. The review also found that it is important to integrate educational activities into existing school curricula whilst involving multiple stakeholders (Verstraeten et al, 2012).

## Health System

It is important that both community- and facility-based health services focus on reducing overweight and obesity. Unique opportunities are present during health service delivery to address maternal diet and weight gain during pregnancy, as well as IYCF practices that are important risk factors for overweight and obesity. The main recommendation is to provide counselling on maternal diet and weight gain during pregnancy, antenatal and postnatal care to address overweight and obesity.

# Additional Research Recommendations

Table 3 summarises additional research recommendations in areas that have been identified as gaps.

**Table 3. Additional Research Recommendations.**

| Research | Recommendation |
|---|---|
| *Dietary intake (long term)* | Promote research on the long-term impact of dietary intake during infancy and early childhood on adult overweight and obesity. |
| *Food choice drivers* | Promote research on drivers of food choice, especially amongst overweight mothers, and how this information can be used to design programmes to engage women and their families. |
| *Integration of overweight/obesity prevention into antenatal and prenatal care* | In settings where undernutrition is still prevalent, test the effectiveness of interventions that integrate infant/child overweight prevention into antenatal and postnatal care. |
| *Underlying causes of overweight/obesity* | Examine the underlying causes that are shared by all forms of malnutrition.<br>Evaluate the appropriateness of the Institute of Medicine guidelines for weight gain during pregnancy (Yaktine & Rasmussen, 2009) within the context of LMIC.<br>Promote research on the association between maternal overweight and obesity, gestational weight gain and child health outcomes. |
| *Women in the workforce* | Promote research on the impact of women entering the workforce on weight status in LMIC and potential impact pathways other than sedentary (inactive) time, such as stress, time pressures and economic independence. |

*Source: Jaacks L, Kavle J, Perry A, Nyaku A. Programming maternal and child overweight and obesity in the context of undernutrition: current evidence and key considerations for low- and middle-income countries. Public Health Nutrition. 2017;20(7);1286–96.*

## MQSUN Resources

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