Overweight and Obesity in the Western Pacific Region

An equity perspective
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FOREWORD

Despite remarkable achievements in recent decades, the Western Pacific Region faces persistent and sometimes widening inequities in health. Nutrition is no exception to this trend. Some population groups face higher exposure to unhealthy environments than others, depending on factors such as gender, household income level and area of residence.

Patterns of inequity in nutrition vary significantly across the Region. High-income countries, such as Australia and New Zealand, experience patterns similar to those in Europe and North America. In these countries, those who are better off are less likely than others to be overweight or obese. The opposite is true in low- and middle-income countries in the Region, where obesity rates are typically higher—often much higher—among those from wealthier population groups. In some cases—such as in Viet Nam—children under five from the richest households are over five times more likely to be overweight or obese than those from the poorest households. With continuing economic development, we are likely to see a transition towards the patterns seen in Europe and North America.

The inequities we see in overweight and obesity originate in people’s choices across the life-course that are shaped by their food environments and the conditions in which they live, work, and age—or, the social determinants of health. These differences across population groups are both unfair and avoidable and need to be tackled. We can reduce the health gap if we address its underlying causes and apply a food systems approach that makes healthy options the easier options for all.

Reducing health inequities, including those in overweight and obesity, is core to ensuring universal health coverage (UHC), a key priority for Member States in the Region. Universal health coverage includes increasing access for all—especially for those who need them the most—to the full range of health services, ranging from health promotion to disease prevention and nutrition services, whether individual- or population-focused.

UHC is also core to advancing the Sustainable Development Goals by 2030, a key feature of which is leaving no-one behind. Improvements in nutritional status are a vital dimension of reducing the present inequities in health. Reducing the inequitable distribution of overweight and obesity calls for targeted interventions within health as well as strengthened partnerships across sectors and stakeholders to address their social determinants.

This publication suggests some key policy measures as ways forward to reshape the current patterns of overweight and obesity in the Region. Opportunities for health and well-being must be available for all.

Shin Young-soo, MD, Ph.D.
WHO Regional Director for the Western Pacific
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# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BMI</td>
<td>body mass index</td>
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<tr>
<td>CI</td>
<td>confidence interval</td>
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<tr>
<td>CRC</td>
<td>Convention on the Rights of the Child</td>
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<td>DALY</td>
<td>disability-adjusted life year</td>
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<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<tr>
<td>GSHS</td>
<td>Global School-based Student Health Survey</td>
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<tr>
<td>HIC</td>
<td>high-income country</td>
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<tr>
<td>LMIC</td>
<td>low- or middle-income country</td>
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<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
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<tr>
<td>NCD</td>
<td>noncommunicable disease</td>
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<tr>
<td>Q1–Q5</td>
<td>quintile(s)</td>
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<td>SD</td>
<td>standard deviation</td>
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<td>STEPS</td>
<td>STEPwise approach to surveillance</td>
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<td>UHC</td>
<td>universal health coverage</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WHA</td>
<td>World Health Assembly</td>
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DEFINITIONS

**Body mass index (BMI)** a simple index of weight-to-height. BMI is age-independent for adult populations and is the same for both genders. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m²).

**Equality** the absence of differences between different groups of people. For example, health equality is the absence of differences in health status or in the distribution of health determinants between different population groups.

**Equity** the absence of avoidable or remediable differences between different groups of people, whether those groups are defined socially, economically, demographically or geographically. For example, health equity has been defined as the absence of systematic disparities in health or its social determinants between more or less advantaged social groups.

**Obesity in adults 18 years and above** defined by the body mass index (BMI). A BMI ≥ 30.0 indicates obesity.

**Obesity in children 5–17 years** defined by a body mass index (BMI) by sex and age above +2 standard deviations (SD) from the WHO growth reference median for persons aged 5–19 years.

**Obesity in children under 5 years** defined by a weight-for-height above +3 standard deviations (SD) from the 2006 WHO child growth standard median for children aged under 5 years.

**Obesogenic environment** the sum of influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations (Swinburn et al., 1999).

**Overweight in adults 18 years and above** defined by body mass index (BMI). A BMI ≥ 25.0 indicates overweight, therefore also including obesity.

**Overweight in children 5–17 years** defined by a body mass index (BMI) by sex and age above +1 standard deviation (SD) from the WHO growth reference median for persons aged 5–19 years, therefore also including obesity.

**Overweight in children under 5 years** defined by a weight-for-height above +2 standard deviations (SD) from the 2006 WHO child growth standard median for children aged under 5 years, therefore also including obesity.

**Stunting in children under 5 years** defined by a height-for-age below -2 standard deviations (SD) from the 2006 WHO child growth standard median for children aged under 5 years.
KEY MESSAGES

- Overweight or obesity and associated noncommunicable diseases (NCDs) have become major public health challenges in the Western Pacific Region. The prevalence of overweight or obesity varies greatly among countries and areas in the Region. Many countries are facing a double burden of malnutrition, where increasing rates of overweight and obesity are coupled with high rates of undernutrition, including stunting.

- There are limited data available on overweight and obesity among children, adolescents and adults that are disaggregated by relevant social stratifiers, for example area of residence, household socioeconomic status and ethnicity. Available data reveal considerable inequities in the burden of overweight and obesity in the Western Pacific Region:
  - In low- and middle-income countries, the prevalence of overweight or obesity is higher among women, similar to what has been observed globally, whereas in high-income countries men are more often overweight or obese. Among children under 5 years of age, boys tend to be more overweight or obese than girls in most countries in the Region, although the differences are generally small.
  - Overweight or obesity are considerably more common in urban than in rural households.
  - In most low- and middle-income countries, children and adults from lower-income households are less likely to be overweight than people from higher-income households. The opposite is true in high-income countries, where socioeconomically disadvantaged populations are significantly more likely to be overweight.
  - There are large disparities in the burden of overweight or obesity across different ethnic groups and between geographical areas within countries.

- Inequities in overweight or obesity depend on differences between population groups and geographical areas in relation to, for example, socioeconomic context and position and exposure to and vulnerability to obesogenic environments.

- Reducing inequities in overweight and obesity requires a comprehensive approach that addresses their social determinants, including policies for both prevention and management that target disadvantaged groups and aim to reduce their accumulated disadvantage, thereby ensuring social justice.

- A range of policy options at different levels is necessary to provide healthier food environments to all. These include, among others, restricting the marketing of unhealthy foods, school- and community-based interventions to increase physical and economic access to healthy food options and a diverse diet, social protection schemes, support for mothers to breastfeed, and adequately disaggregated monitoring and evaluation systems. Interventions must take into account the needs and perceptions of different vulnerable groups and use participatory approaches to involve them in the design, delivery and evaluation of actions and services.
1. Introduction

Overweight and obesity have become urgent global health issues in recent decades. Globally, the number of overweight children under the age of 5 years has increased from 32 million in 2000 to 41 million in 2014, corresponding to an increase in prevalence from 5.0% to 6.1% (1). It is estimated that, at the current pace, by 2020 some 9% of all children under 5 years will be overweight (2). Furthermore, an increase in adult obesity prevalence has been observed in all countries, and globally the prevalence of obesity among adults has doubled from 1980 to 2014, from 5% to 11% for men and from 8% to 15% for women (3). Overweight and obesity were estimated to account for 3.4 million deaths annually and 93.6 million disability-adjusted life years (DALYs)¹ in 2010 (3).

The burden of overweight and obesity is inequitably distributed and affects some population groups and geographical areas more than others, based on their social characteristics, which are also inequitably distributed. Vulnerability to overweight and obesity might depend on, for instance, urban or rural residence, socioeconomic status, ethnicity or the geographical area where people live and their nutritional status in the first 1000 days of life.

This report intends to assist policy-makers in the World Health Organization (WHO) Western Pacific Region by contributing to a better understanding of the unequal distribution of overweight and obesity in the Region, and by providing policy options to address the social determinants of overweight and obesity. Identifying vulnerable population groups or areas can help policy-makers, programme managers and other actors to improve programme targeting and increase the effectiveness and improve the health and well-being of the most vulnerable.

Drivers of overweight and obesity

The major force behind the increase in the prevalence of overweight and obesity globally has been the shift in food environments towards greater availability of and access to unhealthy foods and beverages, which are often low cost in comparison to healthier options. In addition, the problem is compounded by reduced levels of physical activity. While the direct cause of overweight and obesity is an energy imbalance between calories consumed and calories expended, their underlying causes are more complex. Environments and contexts people live in affect their likelihood of being exposed to risk factors for overweight, obesity and noncommunicable diseases (NCDs), as well as their ability to make healthier choices and overcome an unhealthy weight. These environments and contexts are created and changed through different processes, including urbanization, globalization and international trade (4,5).

¹ One DALY can be thought of as one lost year of “healthy” life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. Source: http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/
Maternal undernutrition and suboptimal in utero nutrition are additional major determinants of overweight, obesity and NCDs in adulthood [6]. Optimal breastfeeding has also been proven to lower the risk of overweight and obesity later in life [7,8], nevertheless the lack of supportive environments for mothers to breastfeed, including weak laws on maternity protection and on restricting the marketing of breast-milk substitutes, adds an additional challenge. Being chronically malnourished in the first 1000 days of life, resulting in being too short for one’s age (stunted) is an important risk factor for overweight and obesity. Limited knowledge of healthy diets among the population, inadequate labelling and the aggressive marketing of unhealthy processed products have also been recognized as indirect causes of the increase in overweight and obesity [9,10]. Marketing has a direct effect on children’s nutrition knowledge and their preferences, purchases and consumption [10]. There is evidence that the marketing of unhealthy processed foods is targeted at vulnerable groups, including children, ethnic minorities and low-income neighbourhoods [11].

Health consequences of overweight and obesity

The consequences of overweight and obesity are complex, ranging from impacts on physical and psychosocial health to immense financial costs, affecting the well-being and development of individuals, communities and societies [9,12].

Overweight and obesity are associated with higher risk of premature death and disability in adulthood through increased risk for NCDs, including metabolic syndrome, type 2 diabetes mellitus, hypertension, high cholesterol, cardiovascular diseases, asthma and obstructive sleep apnoea, as well as certain types of cancer and musculoskeletal disorders [9]. Potential psychosocial consequences include, for example, discrimination, social stigmatization, poor body image, low self-esteem and depression [9].

Overweight and obesity also have economic consequences for individuals and society in terms of increased health-care costs, loss of productivity, and lowered capacity for people to study and work [12]. A recent review estimated the global economic cost of obesity at around US$ 2 trillion, similar to the economic impact of armed violence, war and terrorism or use of tobacco products [13].

More and more low- or middle-income countries (LMICs) are facing the double burden of malnutrition, that includes both undernutrition and overweight or obesity, with related NCDs present in the same population, the same community or even the same person at a specific time or in the course of a lifetime for an individual. At the individual level, children who were undernourished in utero and during early childhood and are too short for their age (stunted) are at a particular risk for overweight, obesity and NCDs in adulthood [6,14]. Thus, children who are vulnerable and underprivileged can face further ill health and premature death as adults.

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2 For example, an overweight individual who has micronutrient deficiencies, such as anaemia.
Exposure to risk factors

Depending on various socioeconomic factors, such as gender, socioeconomic status and area of residence, some groups face inequitable exposure to unhealthy environments. These inequities contribute to disparities in health and nutrition outcomes.

Though mostly from high-income countries (HICs), several studies have shown that poorer neighbourhoods and neighbourhoods with predominantly ethnic minorities provide residents with lower access to healthy foods than richer and predominantly white neighbourhoods. Calorie-dense but nutrient-poor foods can also often be cheaper than healthier food options, affecting the financial access to healthy diets among poor populations.

In addition to challenges for a healthy diet, the rapid economic shift in many countries from traditional agrarian economies to industrial economies, replacing labour-intensive work with more sedentary occupations, has lowered the level of daily physical activity. Urban populations in particular face several barriers to physical activity, such as lack of safe neighbourhoods or outdoor spaces for walking or other outdoor activities, lack of open spaces and playgrounds in schools and communities, and lack of active transportation alternatives. At home, technological devices are increasingly replacing tasks formerly done by hand, and activities such as watching television, using the Internet and mobile phones, and playing video games are becoming more popular leisure activities among children and young people in several settings and income groups.

Environments that either promote or hinder physical activity are also inequitably distributed. In the United States of America, for example, it has been shown that neighborhoods with a higher concentration of lower-income or ethnic minority households are significantly less likely to have facilities for physical activity and have lower physical activity levels among adolescents.

Mandates

In the face of such challenges, the United Nations General Assembly declared the period 2016–2025 as the Decade of Action on Nutrition, and the Sustainable Development Goals have included indicators related to all forms of malnutrition. The World Health Assembly endorsed targets and policy options to promote better nutrition and prevent and control NCDs. In 2012, the World Health Assembly endorsed the Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition and set six global nutrition targets to be achieved by 2025, one of which is to halt the increase of childhood overweight or, in countries where the prevalence is already higher than the global average, to reduce the prevalence to the global level of childhood overweight – using the prevalence in 2012 as a baseline. In 2013, the World Health Assembly endorsed the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020 and its nine voluntary NCD targets, one of which is to halt the rise in

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2 The six global nutrition targets address stunting and wasting in children, low-birth-weight, anaemia in women, importance of exclusive breastfeeding and childhood overweight.
diabetes and obesity among adults and adolescents. As of 2016, only 34% of countries with data on overweight among children under 5 years of age were on track to meet the childhood overweight target by 2025 [22], indicating that a concerned effort in this area is still needed.

The World Health Assembly has also recognized the need to tackle inequities related to health and in 2009 requested WHO to better integrate actions to address the social determinants of health to reduce health inequities in its work [23]. The decision was based on the 2008 report of the WHO Commission on Social Determinants of Health, which stressed that the conditions in which people are born, live, work, play and age play a large role in determining the health of populations.

Reducing health inequities is a key guiding principle of several regional strategic documents recently agreed upon by Member States in the Western Pacific Region, including the Action Plan to Reduce the Double Burden of Malnutrition in the Western Pacific Region (2015–2020) [24] and the Western Pacific Regional Action Plan for the Prevention and Control of Noncommunicable Diseases (2014–2020) [25]. Equity is also vital for achieving the goal of ensuring universal health coverage (UHC) and a key element of the action framework Universal Health Coverage: Moving Towards Better Health [26], endorsed at the sixty-sixth session of the WHO Regional Committee for the Western Pacific in October 2015.

**Current actions to prevent overweight and obesity**

There is growing evidence on a number of strategies and interventions that can effectively prevent overweight and obesity throughout the life course [3,27,28]. These strategies and interventions include:

a] promotion, protection and support to exclusive breastfeeding until 6 months of age, followed by appropriate introduction of varied, locally available and nutritionally adequate complementary foods accompanied by breastfeeding until 2 years of age, and beyond;

b] restrictions to marketing of foods and non-alcoholic beverages high in fats, free sugars and salt to children;

c] reformulation of food products to reduce the total fats, free sugars and salt content and to virtually eliminate industrial trans fats from processed foods;

d] adoption of comprehensive and easy-to-understand food and nutrition labelling that facilitate consumer awareness on healthier options for foods and beverages;

e] use of fiscal policies, including taxation and subsidies, to incentivize healthy food and disincentivize unhealthy food purchases;
Nevertheless, there are still knowledge gaps on the application of these strategies for disadvantaged groups and how they can and should be adapted to better reach them and reduce inequities in health throughout the life course. Policy-makers commonly do not have easily available information that shows which groups in society are more affected by overweight and obesity, how inequities may be playing a role in this burden, and how interventions to prevent overweight and obesity can be planned to ensure that groups with the highest need benefit the most. This report intends to support policy-makers in the Western Pacific Region by providing key information to help address these gaps, while acknowledging that further research is needed to fully bridge these gaps.

Methodological considerations

Data on overweight and obesity for children used in this report come from various population-based surveys such as Demographic and Health Survey (DHS), Multiple Indicator Cluster Survey (MICS) and other national surveys. Data on adult overweight or obesity were gathered from WHO STEPwise approach to surveillance (STEPS) surveys or other national surveys, for example DHS. Most data were obtained from WHO Global Database on Child Growth and Malnutrition and WHO Global Health Observatory Data Repository or the final reports of the surveys. Data on adolescents come from Global School-based Student Health Survey (GSHS).4

To identify entry points for interventions on overweight and obesity from an equity perspective, this report uses the priority public health conditions analytical framework (see section 2). Policy options presented here are based on previous reviews conducted by WHO globally and for Europe (23,31) and on other existing literature on the topic, and are complemented with relevant information from the Western Pacific Region when available.

4 GSHS is a study among adolescents 13–17 years old, conducted in several countries in the Region, including data on height and weight, consumption of carbonated soft-drinks and fast food (29). Data for height and weight were derived from self-reported weight and height (except in Malaysia where they were measured by a data collector), and thus, might underestimate the prevalence of overweight and obesity (28).
2. Equity and health: an overview

Equity is the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically (32). Equity in health has been defined as “absence of systematic disparities in health [or its social determinants] between more or less advantaged social groups” (33). These groups might be based on socioeconomic status (according to wealth, income, occupation or educational status), ethnicity, race, religion, location of residence, age, gender, sexual orientation, disability or other relevant characteristics (33).

Some inequalities are unavoidable, for example old and young people are expected to have differing health statuses and, biologically, men and women have certain different qualities. On the other hand, inequities are those inequalities that are unjust, unfair and avoidable. The poorer nutritional status of children living in rural compared to urban households, or the lower immunization rates of children from poorer versus richer households are examples of unfair, avoidable inequalities.

Equity in health is, therefore, concerned with reducing avoidable or unfair differences, including by creating equal opportunities for health across population groups and areas, thereby promoting social justice. Creating equal opportunities for health and nutrition includes, for example, ensuring availability of and access to healthy diets and physical activity, knowledge on good nutrition, and good-quality health services.

Nonetheless, ensuring health equity requires policies and actions not only in the health sector, but from a range of sectors. This is due to the fact that inequities in health arise from the unequal distribution of the determinants of health, which include health services, but also power, income, goods and services, poor and unequal living conditions, poor working conditions and health-damaging behaviours, as well as the overarching macro policies in a country (Fig. 1).
Efforts to reduce health inequities need to focus on their social determinants, targeting the root causes of inequitable health and nutrition outcomes. The Commission on Social Determinants of Health (35) suggested the following principles for action:

1. Improving life conditions, which are the circumstances in which people are born, grow, live, work and age.
2. Tackling inequitable distribution of power, money and resources at all levels (global, national and local) as structural drivers of those life conditions.
3. Monitoring health inequities by measuring the problem, evaluating action and expanding the knowledge base for action.

Measuring the phenomenon is a crucial first step. Aggregated data presented at global or regional levels mask the differences between and within countries and populations (36). Within countries, there might be considerable differences in health and nutrition between different social groups, such as men and women, poor and non-poor, rural and urban populations, or people from different ethnic groups. In order to reveal health disadvantages (for example, disparities in health between different population groups and geographical areas), health gaps (between those groups that are worse off and other groups) and health gradients (across the whole spectrum of the population), disaggregated data need to be collected and analysed and the findings used to inform policies and programmes (37).

The WHO Ending Childhood Obesity Commission recognized equity as an important overarching guiding principle for policies on childhood obesity (28). Equity is also vital for ensuring the overarching goal of ensuring UHC, so that the health services needed, including health
promotion, prevention and treatment, rehabilitation and palliative care, are available to all people without putting them in a situation of financial hardship (38).

Equity is one of the essential health system attributes that countries should maximize on the road to UHC (Fig. 2) through a range of actions including implementing financial protection mechanisms to reduce economic barriers to accessing health services, promoting connectivity between health and social protection, ensuring that disadvantaged groups can access quality services, and applying non-discrimination as a broader social policy and an important principle for health service delivery (26).

**Fig. 2. Essential attributes and action domains leading to universal health coverage**

![Equity, Resilience, Quality, Accountability, Efficiency](image)

Source: Adapted from WHO Regional Office for the Western Pacific, 2015 (26).

The Priority Public Health Conditions Knowledge Network of the Commission on Social Determinants of Health proposed a framework (Fig. 3) outlining the equity dimensions of public health conditions across three dimensions of activity (analyse, intervene and measure) and the following five potentially overlapping levels:

- **Socioeconomic context and position**
  refers to the influence of social position, power and resources in the distribution of health in a population and the effects of social stratification in health inequities. This includes factors such as income, education, work, gender and ethnicity.
- **Differential exposure**
  refers to the fact that social position influences the exposure to material, psychosocial and behavioural risk factors. The higher the social position, the lower the exposure to some common risk factors, such as low food availability and poor dietary quality.

- **Differential vulnerability**
  refers to the fact that the same level of exposure may have different effects on different groups, depending on cumulative life-course factors regarding their social, cultural and economic environments.

- **Differential health-care outcomes**
  derive from the equity principle that health care should be provided according to the individual’s needs, regardless of social circumstances, ethnicity, etc. in order that all should achieve the same health outcomes. However, health systems may in practice provide services that are not equitable, not prioritizing disadvantaged groups, generating therefore differential health-care outcomes.

- **Differential consequences**
  refers to the greater impact caused by ill health in disadvantaged groups, due to their accumulated disadvantage, including increased social vulnerability and lack of job security or health insurance, among other factors. For such groups, poor health may create additional social and economic consequences, which in turn impact their health.

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**Fig. 3. Priority public health conditions analytical framework**

INTERVENE → ANALYSE → MEASURE

- **Socioeconomic context & position**
  (society)

- **Differential exposure**
  (social & physical environment)

- **Differential vulnerability**
  (population group)

- **Differential health outcomes**
  (individual)

- **Differential consequences**
  (individual)

Source: Blas et al. 2011 (23).
Children are especially vulnerable to inequities due to their dependence on other people and their legal and economic status in society. The United Nations Convention on the Rights of the Child (CRC) (39), ratified by all countries in the Western Pacific Region, protects and promotes the rights of the child to survive, thrive, grow, learn, have their voices heard and reach their full potential.

According to CRC, Member States are required to:

- pursue measures to provide adequate nutrition to all children (Article 24: 2c);
- “ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition” (Article 24: 2e); and
- encourage the provision of safe and appropriate recreational and leisure activities to children (Article 32: 2).

The treaty also requires States Parties to “recognize the right of the child to be protected from economic exploitation ... that is likely to be hazardous or to interfere with the child’s education, or to be harmful to the child’s health or physical, mental, spiritual, moral or social development” (Article 32: 1).

CRC mandates countries to protect all children from harmful food environments and instead promote and protect children’s right to healthy living, including good nutrition and physical activity. Inequities in these environments must be addressed, in order to protect the rights of the child regardless of his or her social characteristics or geographical location.
2.2. Inequities in overweight and obesity

Inequities in overweight and obesity can be observed across the five levels described in Fig. 3, and have been described in a 2014 WHO publication \cite{31}, summarized here. The socio-economic context and position can promote increased levels of food poverty, social exclusion and marginalization, decreased access to fruits and vegetables or opportunities for safe physical activity and active transportation, and increased consumption of highly processed foods of low nutritional value. In some cultures, traditional gender norms may preclude girls and women from participating in physical activities, or privilege boys with unrestricted access to foods considered as treats.

In terms of differential exposure relevant to overweight and obesity, one can highlight the higher exposure of those living in urban poor neighbourhoods to different forms of marketing of foods and non-alcoholic beverages rich in fats, free sugars and salt, in addition to exposure to unhealthy street foods and fast food restaurants and the correspondingly lower exposure to healthy food choices, in addition lower access to safe spaces for physical activity. This has been observed in high-income countries globally and is a growing trend in LMICs worldwide and in the Region.

Additionally, differential vulnerabilities exist for example as a country develops economically, and groups with a lower socio-economic status might be more vulnerable to overweight and obesity. The most socially deprived mothers might breastfeed less because of lack of knowledge of the benefits of breastfeeding (in face of the aggressive marketing of breast-milk substitutes) and the lack of opportunities to breastfeed and be active in the job market (due to lack of maternity protection measures). Pregnant women in poor neighbourhoods are more likely to be malnourished, and this affects the risk for the infant in utero to be overweight or obese later in life.

Differential health-care outcomes can arise from financial barriers to accessing health services and other non-financial barriers to accessing services, such as geographical access, time availability, work situation and morbidity related to overweight and obesity. Inequities exist in access to health-care services throughout the Western Pacific Region, which also affect the health services related to the prevention and management of overweight and obesity. In addition, at the individual level, this can have differential consequences, for example when discrimination and stigma due to overweight and obesity interacts with existing marginalization of disadvantaged groups, leading to worsened social exclusion.

Inequities observed across these five levels add up and lead to accumulated disadvantage throughout the life course, from the in utero stage to older age (as illustrated in Table 1).
Table 1. How inequities in obesity can compound over the life-course

<table>
<thead>
<tr>
<th>Stage in the life cycle</th>
<th>Usual disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>In utero stage</td>
<td>▶ Poor nutritional status of mother at conception and throughout pregnancy, including unhealthy weight and micronutrient deficiencies.</td>
</tr>
<tr>
<td></td>
<td>▶ Child less likely to be born with an optimal weight.</td>
</tr>
<tr>
<td></td>
<td>▶ Mother susceptible to aggressive marketing of breastmilk substitutes and provision of infant formula samples.</td>
</tr>
<tr>
<td>Childhood</td>
<td>▶ Mother without community support to breastfeed.</td>
</tr>
<tr>
<td></td>
<td>▶ Mother without paid maternity leave or other support to breastfeed in the workplace, leading to a decreased likelihood of optimal breastfeeding.</td>
</tr>
<tr>
<td></td>
<td>▶ Mother in informal employment with no protection or support to breastfeed, leading to a decreased likelihood of optimal breastfeeding.</td>
</tr>
<tr>
<td></td>
<td>▶ Child less likely to have access (physical and economical) to adequate dietary diversity through complementary foods.</td>
</tr>
<tr>
<td></td>
<td>▶ Child more likely to be exposed to marketing of unhealthy foods and non-alcoholic beverages rich in fats, free sugars and salt.</td>
</tr>
<tr>
<td></td>
<td>▶ Child with limited possibilities for physical activity at home, at school and in the community due to lack of safe space, sports events and active transportation and because of outdoor air pollution, or hot climates.</td>
</tr>
<tr>
<td>Adulthood and older age</td>
<td>▶ Increased likelihood of experiencing food insecurity, due to lack of availability and economic and physical access to adequate, diversified foods.</td>
</tr>
<tr>
<td></td>
<td>▶ Specifically in urban areas, increased likelihood to live near establishments selling high-energy and poor nutritional value foods and meals, added to limited availability of healthier affordable options.</td>
</tr>
<tr>
<td></td>
<td>▶ Poor housing, unreliable means of cooking and keeping food, including lack of refrigeration.</td>
</tr>
<tr>
<td></td>
<td>▶ Low-paid, long hour employment and long commute, with little opportunity for rest and physical activity.</td>
</tr>
<tr>
<td></td>
<td>▶ Increased likelihood of having suboptimal access to health care.</td>
</tr>
<tr>
<td>Adulthood and older age</td>
<td>▶ Increased likelihood of experiencing discrimination in health and other services.</td>
</tr>
<tr>
<td></td>
<td>▶ Increased likelihood of suffering financial hardship due to illness or being unable to afford the required health care.</td>
</tr>
<tr>
<td></td>
<td>▶ Decreased likelihood of getting time off work or affording transportation to health services.</td>
</tr>
</tbody>
</table>

Source: Adapted from Loring and Robertson (2014) (31).
3. Overweight and obesity in the Western Pacific Region through an equity lens

Overweight and obesity have become alarming public health challenges in the Western Pacific Region. One third (33%) of all adults in the Region were overweight or obese in 2014, an increase from 29.3% in 2010 [40]. The prevalence of obesity among adults has also increased from 5.4% in 2010 to 6.9% in 2014. All countries in the Region with available data have seen an increase in adult overweight or obesity between 2010 and 2014 [40]. Overweight and obesity are not just a challenge among adults; in 2014, 6.2 million young children (or 5.2% of all children under 5 years of age) were overweight or obese in the Region [1].

It should be noted that the regional prevalence estimates are greatly distorted by China since the population of China accounts for more than 70% of the Region’s population of more than 1.8 billion people. Moreover, regional estimates give little information of the situation in individual countries.

The prevalence of overweight or obesity varies greatly among countries in the Region: from 1.5% in Japan to 17% in Tonga among under-5 children [1] and from 19% in the Lao People’s Democratic Republic [40] to 93.5% in American Samoa [41] among adults. Among school-going adolescents aged 13–15 years, the prevalence of self-reported overweight or obesity ranges from 3.7% in Cambodia [42] to 59.9% in Tonga [43]. Adult overweight or obesity prevalence exceeds 60% in all Pacific island countries [40,41,44,45] and adolescent overweight exceeds 40% in Cook Islands [50], Nauru [46], Niue [49], Samoa [48], Tonga [43] and Tuvalu [47], making the issue especially urgent for the Pacific island countries.

Increased urbanization, globalization, marketing and international trade have promoted important shifts in food environments towards increased availability, acceptability, affordability and access to unhealthy foods and beverages, accompanied by reduced opportunities for safe physical activity and active transportation. In such environments, it is more difficult for people to make healthier choices and adopt healthier behaviours [51].

A diet shift from consuming fresh local and traditional foods towards increased consumption of processed foods that are energy-dense and nutrient-poor has been observed in many countries in the Region. In Malaysia, a shift towards diets higher in sugars, fats and animal products have been observed between 1961 and 1997 [52]. A study from the Federated States of Micronesia showed that rice, wheat flour, sugar and imported meats have widely replaced local foods [53]. A shift towards diets higher in fats has also been observed in China [54,55] and among women in the Philippines [56]. Moreover, the recommended consumption of fruits and vegetables, a key factor for a healthy weight, is not met in the Region. Among students aged 12–15 years in the Region, 68.3% of boys and 69.4% of girls do not meet the recommended intake of fruits and vegetables [57]. Marketing of foods and non-alcoholic beverages to children is one of the key concerns in the fight against increasing overweight and obesity [Box 2].
Together with unhealthy diets, insufficient physical activity is one of the major determinants of overweight and obesity. According to the Global status report on noncommunicable diseases 2014, 85% of adolescents 11–17 years in the Western Pacific Region lack sufficient physical activity\(^5\). For adults, the prevalence of insufficient physical activity\(^6\) in the Region is 25%, ranging from 5.6% in Niue to 62.2% in American Samoa \((3,40,44)\).

**Box 2. Marketing of foods and non-alcoholic beverages to children in the Western Pacific Region**

In 2010, the World Health Assembly endorsed a Set of recommendations on the marketing of foods and non-alcoholic beverages to children [Resolution WHA63.14] \((58)\). The purpose of the recommendations is to guide Member States in designing policies on food marketing targeting children in order to reduce the impact of marketing of unhealthy foods and beverages to children.

Evidence from the Western Pacific Region, mostly concerning television advertising, shows that children are highly exposed to marketing of unhealthy foods and non-alcoholic beverages. For example, snacks, candy \((59)\) and sugar-sweetened beverages are broadly advertised to children on television in Malaysia \((60)\). On television, advertisements of unhealthy foods and beverages accounted for almost 60% of all food advertisements during children’s programmes in Singapore \((61)\), and 81% during the whole day in Australia \((62)\). In the Republic of Korea, the amount of television food advertisements fell by 19% between 2004 and 2009, nevertheless restaurant and fried chicken franchise advertisements nearly doubled over the same period \((63)\). In China, Malaysia and the Republic of Korea, unhealthy foods and beverages accounted for the majority of all food advertisements and the frequency was generally higher during children’s peak viewing times \((64)\). More than one third of the food advertisements used celebrities or cartoon characters to promote their product, most frequently during children’s peak viewing times. In Australia, celebrities and cartoon characters, competitions, premium offers and other persuasive marketing techniques were also most commonly used during children’s peak viewing times \((65)\). There is also evidence in the Region \((60)\) and elsewhere \((11,131)\) that disadvantaged ethnic groups are more exposed to marketing of unhealthy foods and beverages.

\(^5\) WHO defines insufficient physical activity among children 5–17 years as less than 60 minutes of physical activity of moderate to vigorous intensity per day.

\(^6\) WHO defines insufficient physical activity among adults 18 years and older as less than 150 minutes of physical activity of moderate intensity per week or less than 75 minutes of physical activity of vigorous intensity per week.
Marketing of foods and beverages to children is also common in other types of media, such as magazines (66), Internet (67), and in and around schools. Studies using data from Australia, Mongolia and the Philippines show that the density of advertisements of unhealthy foods and beverages was much higher around schools than in other areas (68,69). A study conducted in New Zealand reports that schools were commonly sponsored by companies that offer unhealthy foods or beverages (70); sponsorships by the food industry have also been reported in Australia, for example for children’s sports activities (71). It is increasingly important to consider marketing in social media, Internet games and other online sources targeting children. Online marketing is widespread, relatively unregulated, uses interactive, persuasive and novel marketing techniques, and is accessible to many children (67,72).

Research also shows that self-regulation is ineffective in restricting marketing that targets children. For example, in Australia food companies that signed the self-regulation initiative had the most advertisements on television during children’s peak view times (73,74). The frequency of television advertising of unhealthy foods and drinks to children has remained at similar levels since before the industry’s self-regulation initiatives (75,76).

Importantly, overweight and obesity in the Western Pacific Region must be seen in the context of the double burden of malnutrition, which affects most countries in the Region. In middle-income countries such as China (77), Fiji (77), Mongolia (78) and Tuvalu (79), the prevalence of overweight is almost as high as that of stunting. In Papua New Guinea, almost 50% of the under-5 children are stunted, while the rate of overweight among under-5 children is one of the highest in the Region (14%) (77).

The next sections present data on overweight and obesity in countries in the Western Pacific Region stratified by sex, urban or rural residence, socioeconomic status, ethnicity and geographical region within countries.
3.1. **Overweight and obesity by sex**

An overview of the prevalence of overweight or obesity among children under the age of 5 years in countries in the Western Pacific Region, disaggregated by sex, is presented in Fig. 4. Available data show that more boys tend to be overweight than girls in most countries in the Region; however, the differences are generally small, with some exceptions. In Nauru, the prevalence among boys is more than 3.5 times higher than among girls [80]. In Republic of Korea and Viet Nam, the prevalence is 1.6 times higher among boys than girls [77]. At the global level, a recent analysis of sex differentials in childhood overweight in 78 LMICs did not find significant differences between boys and girls [6].

*Fig. 4. Prevalence of overweight or obesity (weight-for-height > +2SD) among children under the age of 5 years by sex of the child in different countries in the Western Pacific Region, 2004–2012*

*Children 1–5 years. Source: WHO Global Database on Child Growth and Malnutrition [77]; Solomon Islands National Statistics Office [81]; Nauru Bureau of Statistics [80]; Tuvalu Central Statistics Division [79]; National Statistical Office of Mongolia [78]; Tonga Department of Statistics [82].*
Data on school-going adolescents, aged 13 to 15 years, from 16 countries in the Region show that in most countries the differences in the prevalence of overweight or obesity between adolescent boys and girls are small, with few exceptions (Fig. 5). In Kiribati and Samoa, girls were considerably more often overweight or obese than boys [48,83] but in Viet Nam, the prevalence for boys was almost twice as high as for girls [84]. These data are based on self-reported height and weight, except from Malaysia, and should therefore be interpreted with caution.

*Fig. 5. Prevalence of overweight or obesity (body mass index [BMI]-by-age and sex >+1 standard deviation [SD]) among school-attending boys and girls 13–15 years in the Western Pacific Region based on self-report of height and weight (except for Malaysia)*

Source: Global School-based Student Health Survey Fact Sheets for Brunei Darussalam (2014) [85]; Cambodia (2013) [42]; Cook Islands (2011) [50]; Fiji (2010) [86]; Kiribati (2011) [83]; Malaysia (2012) [87]; Mongolia (2013) [88]; Nauru (2011) [46]; Philippines (2011) [89]; Samoa (2011) [48]; Solomon Islands (2011) [90]; Tonga (2010) [43]; Tuvalu (2013) [47]; Vanuatu (2011) [91], and Viet Nam [2013] [84].
For adults, the prevalence of overweight and obesity tends to be higher among women than men in most LMICs in the Region (Fig. 6), similar to what has been observed globally (92) and in all WHO regions (3). However, men are considerably more often overweight or obese in Australia, Guam, Hong Kong SAR (China), Japan, New Zealand, the Republic of Korea and Singapore, all HICs (40). These findings suggest that the exposures and vulnerabilities to overweight and obesity differ between men and women depending on the socioeconomic context of the country, women being more vulnerable to overweight and obesity in LMICs and men in HICs.

Fig. 6. Prevalence of overweight or obesity (BMI ≥25) in adult men and women in different countries in the Western Pacific Region


Source: WHO Global Health Observatory Data Repository (40); WHO Western Pacific Region Health Information and Intelligence Platform (44); American Samoa Department of Health (41); French Polynesia Ministry of Health (45).
The possible differences between men and women, and girls and boys, may be partly attributable to some biological differences between sexes, but more importantly to differing expectations, roles and opportunities between genders [92,93], including differential socioeconomic position, differential exposure and differential vulnerabilities to obesogenic environments [94].

Among children under 5 years of age, the prevalence of overweight or obesity was slightly higher among boys than girls in the Western Pacific Region. Different dietary habits and practices may contribute to overweight and obesity among boys versus girls. For instance, a 2010 cross-sectional study at the city level in China revealed that increased consumption of soft drinks (1100 mL/day) was the major risk factor for overweight and obesity in boys, while for girls the main factors associated with such risk were having breakfast outside the home and an increased consumption of energy-dense foods [95]. The tradition of son preference in some societies in the Region might result in differential exposure to risk factors for overweight and obesity. For instance, preferential allocation of household resources to boys, or privileges to boys such as more access to unhealthy foods and treats, along with exemptions such as participating in less physical work, as has been shown in a recent study from China [96], where the prevalence of overweight or obesity among under-5 boys is higher than among girls. In another study from China, boys were more likely to be allowed to eat snacks and sweets and drink sugary beverages than girls; boys were also significantly more likely to be allowed to watch more television than girls [97].

For adults, women were more often overweight or obese in most LMICs, whereas the opposite was shown in HICs. Kanter and Caballero have argued that in many LMICs, wage labour is increasingly replacing agricultural work and it is women who work increasingly in occupations with less physical activity; this, combined with the shift towards energy-dense diets observed in many countries, might make women more vulnerable to overweight and obesity [92]. In addition, different sociocultural factors might affect the gender disparities in the burden of overweight or obesity. Body size that is considered preferable for women and men might differ in different contexts and cultures. For example, in the Marshall Islands, where the prevalence of overweight or obesity is higher among women than men, thinness among women has been associated with illness and infertility, whereas large body types have been associated with health [98]. In New Zealand, where gender seems to be associated with diet quality, a recent study found adolescent girls 15–18 years to have a healthier diet than their male counterparts [99].

Globally, as well in the Western Pacific Region, insufficient physical activity is more common among women. In the Region, 27% of women and 23% of men were insufficiently active [40]. For adolescents aged 12–15 years in LMICs in the Region, the prevalence of low physical activity is as high as 66.4% for boys and 72% for girls [57]. In different cultures, boys and girls may receive different encouragement for physical activity. For instance, a study in China reported that girls tend to receive more parental encouragement to participate in sports and other physical activity than boys [97].

* The data were derived from the Global School-based Student Health Surveys (GSHS), and only correspond to adolescents enrolled in schools.
In the Western Pacific Region, childhood overweight and obesity tend to be more prevalent in urban areas than in rural areas, as shown by data from 11 LMICs in the Region (Fig. 7). In Vanuatu and Viet Nam, prevalence of overweight and obesity among under-5 children in urban areas is 2 and 2.5 times higher, respectively, than among children in rural areas (77). In Viet Nam, the differences further increased from 2000 to 2010 (Fig. 8). Yet, while the prevalence of overweight has increased in Viet Nam, especially among urban children, the prevalence of stunting has decreased. In 2010, overweight (8.3%) among urban children in Viet Nam was almost as common as stunting (11.8%), whereas among rural children stunting was still much more prevalent than overweight (26.8% vs. 3.1%), illustrating the differential vulnerabilities of urban and rural children (77).

**Fig. 7. Prevalence of overweight or obesity (weight-for-height >+2SD) among children under the age of 5 years by residence in selected countries in the Western Pacific Region**

Lao PDR = Lao People’s Democratic Republic

Source: WHO Global Database on Child Growth and Malnutrition (77); National Statistical Office of Mongolia (78); Solomon Islands National Statistics Office (81); Tonga Department of Statistics (82).
Data among school-attending adolescents 13–15 years from Cambodia and Mongolia show that overweight or obesity seem to be more common among urban than rural adolescents, especially among boys (Fig. 9) (100–103).

Fig. 9. Prevalence of overweight or obesity (BMI-by-age and sex >+1SD) among school-attending adolescents 13–15 years by residence in Cambodia and Mongolia, based on self-report of height and weight

Source: Global School-based Student Health Survey Fact Sheets for Cambodia Urban (2013) (100); Cambodia Rural (2013) (101); Mongolia Urban (2013) (102); and Mongolia Rural (2013) (103).
For adults, the findings are also similar. In Cambodia, urban adults are significantly more likely to be overweight or obese than adults living in rural areas. The prevalence of overweight but not obese adults (body mass index [BMI] 25–29.9) was 23.1% (95% confidence interval [CI] 19.3–26.9) in urban and 11.5% (95% CI 10.2–12.8) in rural areas. The prevalence of obesity (BMI >=30) was 3.6% (95% CI 2.2–5.0) in urban and 1.5% (95% CI 1.1–2.0) in rural areas.[104]. In China, an analysis of the 2002 National Nutrition and Health Survey showed that urban residents, especially men, were significantly more likely to be obese than rural residents (odds ratio [OR] 1.8, 95% CI 1.7–2.0 for men, OR 1.4, 95% CI 1.3–1.5 for women).[105]. Similarly, 2002 data from Fiji showed that urban residents, especially men, were more likely to be obese than rural residents (OR 2.8, 95% CI 2.0–3.9 for men, OR 1.5, 95% CI 1.2–1.8 for women).[105]. In Mongolia and Malaysia, no significant difference was found in the likelihood of obesity between urban and rural adults.[105,106].

Conversely, in Australia, the prevalence of overweight or obesity among adults in major cities was lower than among those residing in remote areas, especially among women (52.5% versus 63.2%) [107]. They are also more often socioeconomically disadvantaged [108], have less access to services and are more often indigenous Australians [109]. Similarly, a recent study in four Chinese provinces and Beijing city showed that the prevalence of adult overweight was significantly (p<0.01) higher in the rural population (25.4%), compared to populations in urban metropolitan areas (21.2%) [110]. The differences were particularly observed among women, ethnic minorities and among people in the lowest socioeconomic tertile, which can be related to the socioeconomic position of certain groups, increasing their exposure and vulnerability to obesogenic environments.

The analysis conducted by Black et al. [6] in 78 countries found children from urban areas to be slightly more likely to be overweight than children from rural areas. A recent systematic review and meta-analysis of studies from different countries in South-East Asia found a significant association between obesity and urban living environment (compared to rural) among children as well as adults, and in both females and males [111]. The association was stronger in poorer countries, suggesting that those populations might be more vulnerable to the negative effects of urbanization. This is also reflected in our findings from several LMICs, where urban children, adolescents and adults were generally more often overweight or obese than their rural counterparts.

People living in urban settings in LMICs might be more exposed to obesogenic environments than people in rural areas. Aggressive marketing of foods and beverages and the abundance of fast food restaurants and street vendors offering energy-dense, nutrient-poor foods and drinks, combined with sedentary occupations, lack of opportunities for safe play and physical activity in crowded urban environments, have been shown to increase the risk of overweight and obesity among urban residents [7,112]. A recent study from China shows that there have been major shifts towards unhealthier diets in recent decades, including an increase in snacking, consuming processed foods and using unhealthier cooking methods such as frying, and these changes have been most pronounced among the most urbanized populations [55]. However, another study using data from China reports that although overall the diet of urban residents is...
consistently higher in animal-source foods and oils and lower in vegetables, changes towards unhealthier diets have been faster among rural residents.[54]. These findings suggest that the gap between urban and rural residents might be narrowing in some countries. Rapid economic development and changes in the socioeconomic context in many LMICs in the Region might lead to an increased exposure to unhealthy foods and beverages, as well as physical inactivity in rural areas, as has happened in other regions, such as Latin America.[113].

The pattern of physical activity can also differ according to area of residence. For example, Bauman et al. [114] found that high physical activity during leisure time was significantly more common among urban than rural residents in China, whereas high work-related physical activity was significantly more common among rural residents in China, Fiji and Malaysia; high physical activity during commuting was more common among rural residents in Fiji.

The observed disparities in overweight and obesity between urban and rural residents should be taken into account when formulating and implementing policies to address the exposure and vulnerability to unhealthy food environments.

3.3. Overweight and obesity by socioeconomic status

Low- and middle-income countries

The limited data disaggregated by socioeconomic status available in the Western Pacific Region show that in most LMICs, children from low socioeconomic status households are less likely to be overweight than children from high socioeconomic status households (Figs. 10 and 11).

Fig. 10. Prevalence of overweight or obesity (weight-for-height >+2SD) in children under the age of 5 years from lowest to highest household wealth quintiles in selected countries in the Western Pacific Region

Source: Cambodia National Institute of Statistics [115]; Lao People’s Democratic Republic Ministry of Health & Lao Statistics Bureau [116]; National Statistical Office of Mongolia [78]; Nauru Bureau of Statistics [80]; Solomon Islands National Statistics Office [81]; Tonga Department of Statistics [82]; Tuvalu Central Statistics Division [79]; Viet Nam General Statistics Office [117].
Wealth-based differences are especially high in Viet Nam, where the prevalence of childhood overweight or obesity in the richest quintile\textsuperscript{10} is more than 5.5 times higher than in the poorest quintile (8.9% versus 1.6%) \textsuperscript{(117)}. At the same time, a reverse gradient can be observed in prevalence of stunting in Viet Nam, where 41% of the children in the poorest quintile are stunted versus 6.1% in the richest quintile, making overweight more prevalent than stunting among children from richest households. In China, a recent study reports that the rates of overweight and obesity in children 2–17 years old have increased across all socioeconomic status \textsuperscript{11} groups between 1991 and 2006, but the increase has been greatest among the children from the highest socioeconomic status groups \textsuperscript{(118)}.

For adults, data from LMICs are scarcer. In Cambodia, the prevalence of obesity among women of reproductive age is higher for women in the most advantaged income groups, ranging from 0.3% among the poorest to 2.6% among the richest \textsuperscript{(40)}. The wealth gradient in relation to obesity has been roughly consistent from 2000 to 2010. There was no significant difference in the prevalence of obesity in women according to education status in Cambodia \textsuperscript{(40)}. Analysis of 2006 data from Malaysia found no difference in the likelihood of being obese according to income or education status in neither men nor women \textsuperscript{(105)}.

Higher prevalence of overweight or obesity in populations with higher socioeconomic status in many LMICs may be due to their differential socioeconomic position leading to differential exposure to obesogenic environments, compared to food insecurity and laborious occupations.

\textsuperscript{10} Wealth quintiles in demographic and health surveys are based on Wealth Index, which combines easy-to-collect data on a household’s ownership of selected assets, such as televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities. More information: http://www.dhsprogram.com/topics/wealth-index/index.cfm

\textsuperscript{11} Based on household income, parental education status and parental political elite status.
among people with lower socioeconomic status in some LMICs (119). However, as economic development in many LMICs in the Region continues, this is likely to change, increasing exposure to unhealthy food environments in a context of low education and low health and nutrition literacy, which decreases their ability to make healthier choices. People with higher socioeconomic status are better equipped to make healthier choices, as has been observed in many HICs (119,120).

Perhaps one sign of this shift is observed by Mendez and Popkin (54), who examined dietary changes among the Chinese and found that an increase in the consumption of animal-source foods and oils was much faster in the lower socioeconomic groups, both in urban and rural settings. In this 2004 study, even though the wealthier socioeconomic groups still consumed more of these items, a faster increase in the poorer socioeconomic group narrowed the gap between the wealthy and the poor.

**High-income countries**

Data from HICs in the Region show a reverse correlation between socioeconomic status and wealth: the lower socioeconomic status, the higher prevalence of overweight or obesity. In New Zealand, children 2–14 years of age living in the most-deprived areas (12) are three times more likely to be obese than children living in the least-deprived areas, even after taking into account the ethnicity, sex and age compositions of these populations (Fig. 12) (121). Similar findings have been observed among Australian children aged 2–17 years, with obesity rates ranging from around 21% in the highest socioeconomic status (13) quintiles to around 30% in the lowest socioeconomic status quintiles (107). In the Republic of Korea, children and adolescents (14) from the lowest socioeconomic status tertile were 30% more likely to be overweight or obese than children and adolescents from the highest socioeconomic status tertile in a 2009 study (122). Similarly, a study from Japan shows that lower socioeconomic status was associated with overweight among adolescents (123).

Among adults in Australia, 64% of women in the most disadvantaged quintile (see footnote 15) were overweight or obese compared to 48% in the least disadvantaged quintile (107). No statistically significant difference was observed among men. In New Zealand, the prevalence of obesity among both men and women was higher the more deprived the area of residence was (see footnote 14), especially among women. Prevalence of obesity in women in the most-deprived areas was 48% compared to 18% in the least-deprived areas (124).

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12 Based on the NZDep2013 Index of Socioeconomic Deprivation, which combines census data relating to income, home ownership, employment, qualifications, family structure, housing, access to transport and communications. More information: http://www.health.govt.nz/publication/nzdep2013-2/index-deprivation

13 The socioeconomic status quintiles in Australia are based on the Index of Relative Socio-economic Disadvantage, which is a general socio-economic index that summarizes a range of information about the economic and social conditions of people and households within an area.

14 From 4th grade elementary school to high school students.

15 Socioeconomic status tertiles in this study are based on four categories: subjective economic status, parental education level, parental occupational status and family structure.

16 Based on household expenditure and parental educational attainment.
In summary, in the Western Pacific Region, the exposure and vulnerability to overweight and obesity are clearly related to the socioeconomic context and position of different population groups. In LMICs, people with higher socioeconomic status are more often overweight or obese than people with lower socioeconomic status; undernutrition, including stunting, still often prevails, especially among children with lower socioeconomic status. In HICs, however, socioeconomically disadvantaged people are disproportionately burdened by overweight and obesity, with higher prevalences of overweight and obesity observed in lower socioeconomic status groups.

Socioeconomic status has been linked to several determinants of a healthy weight, including, for example, screen viewing time. Findings from a 2014 study from Hong Kong SAR (China) indicate that television viewing time was positively associated with increased BMI and obesity, while television viewing time decreased with education level and vigorous physical activity [126]. In Japan, prolonged television viewing time was associated with lack of full-time employment, lower education status and overweight both in adult men and women [127].

Physical activity patterns can also differ according to socioeconomic status. Highly educated people in Australia, China and Fiji, and people with high income in China, Australia [only women] and the Philippines [only women] were more likely to have high physical activity during leisure time compared to people with low education or income [114]. At the same time, people with low education and income in China were more likely to have high work-related and high travel-related physical activity [114]. In New Zealand, healthier diets among adolescents were associated with being from the least-deprived socioeconomic groups [see footnote 14] [99].

The observed differences between LMICs and HICs indicate the need to tailor interventions to the country context. While many LMICs in the Region are experiencing rapid economic development, it is important to consider how to control the exposure to obesogenic environments and how to enable availability and access to fresh, healthy foods and physical activity in a way that does not disproportionately affect the already disadvantaged population groups.
3.4. Overweight and obesity by ethnicity

The available data from the Region show that there can be major differences in the prevalence of overweight or obesity across different ethnic groups, both for children and adults.

In Viet Nam, the prevalence of overweight or obesity among under-5 children belonging to Kinh or Hoa17 groups was almost three times higher than in other ethnic groups (4.9% among Kinh/Hoa versus 1.7% among other ethnicities) [117]. Other ethnic groups have generally lower standards of living, thus the differing levels of childhood overweight or obesity between Kinh/Hoa and other ethnicities might be largely due to differing socioeconomic status between the groups.

In Lao People’s Democratic Republic, children from Hmong–Mien and Chinese–Tibetan ethnic minority groups have more than twice as high prevalence of overweight than children from the ethnic majority group Lao–Tai (Fig. 13) [116]. The Chinese–Tibetan and the Hmong–Mien people are small minorities living primarily in the remote mountainous areas in the northern part of the country. These findings contradict the finding from other LMICs in the Region that rural populations and disadvantaged populations are generally less often overweight than urban and socioeconomically advantaged populations (see section 3.2), and illustrates the complexity of the challenge of inequities in overweight or obesity and highlights the importance of analysing the context-specific situation to identify vulnerable groups.

Stunting is also much more common among the Hmong–Mien and Chinese–Tibetan children (60.5% and 60.9%, respectively) compared to Lao–Tai children (33.4%), illustrating the double burden of malnutrition in these disadvantaged communities [116].

*Fig. 13. Prevalence of overweight or obesity (weight-for-height >+2SD) among children under the age of 5 in different ethno-linguistic groups in the Lao People’s Democratic Republic, 2011–2012*

Source: Lao People’s Democratic Republic Ministry of Health & Lao Statistics Bureau [116].

17 In the MICS 2011, the groups Kinh (the ethnic majority in Viet Nam) and Hoa (the Chinese minority) were grouped together, as the two groups reportedly have similar living standards. Together they make up approximately 90% of the survey population [117].
In Mongolia, levels of under-5 overweight or obesity according to the ethnicity of the head of the household also show some disparities. Khalkhs, by far the largest ethnic group in Mongolia, have the highest prevalence of under-5 overweight (11.2%), whereas Khazakhs, a minority group residing for the most part in the remote Western region of the country, have a prevalence almost 30% lower (8.1%) (78).

In New Zealand, children 2–14 years old from Maori and Pacific ethnic origin are significantly more likely to be obese than children from Asian or European origin (Table 2) (121). Maori children are twice as likely and Pacific children are three times as likely to be obese than other children. On the other hand, children of Asian origin were 50% less likely to be obese than other children. Neighbourhood deprivation (see footnote 14) was identified as the main determinant of obesity, thus, the lower socioeconomic status of the Maori and Pacific children compared to other children explain much of the difference in the prevalence of obesity. Another study from New Zealand found non-Maori and non-Pacific ethnicity to be associated with healthier diets among adolescents, however, again, lower socioeconomic status of Maori and Pacific ethnic groups are likely to be the explanation for this finding (99).

Table 2. Prevalence of obesity in children 2–14 years of age in New Zealand by ethnicity, 2012–2013

<table>
<thead>
<tr>
<th></th>
<th>Pacific</th>
<th>Maori</th>
<th>European/other</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total %</strong></td>
<td>27.1</td>
<td>18.6</td>
<td>7.5</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Girls %</strong></td>
<td>23.9</td>
<td>18.3</td>
<td>6.5</td>
<td>5.9</td>
</tr>
<tr>
<td><strong>Boys %</strong></td>
<td>30.4</td>
<td>18.9</td>
<td>8.4</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Rate Ratio</strong></td>
<td>3.17 (2.47-4.06)</td>
<td>2.20 (1.74-2.79)</td>
<td>0.48 (0.31-0.74)</td>
<td></td>
</tr>
</tbody>
</table>

* Adjusted for age and sex. Obesity defined by child age- and sex-specific BMI cut-off points according to Cole et al. 2000 (125).

Source: New Zealand Ministry of Health (121).

Disparities in overweight or obesity according to ethnicity are also found among adults. Data from Fiji from 2002 show that Fijian men were significantly more often obese than Indian Fijian men (11.3% versus 5.9%) (128). Fijian women were significantly more likely to be obese than Indian Fijian women (32.0% vs. 15.8%). Both men and women from other (non-specified) ethnicities were significantly more often obese than both Fijian and Indian Fijian men and women. In Malaysia, the 2005–2006 STEPS survey revealed significant differences in prevalence of obesity between women from different ethnic groups, ranging from 10.9% among women of Chinese origin to 25.7% among women of Indian origin (Table 3) (129). While there seems to be differences in prevalences between different ethnic groups among men and in both sexes combined, these did not reach statistical significance.
Table 3. Prevalence of obesity (BMI >=30) among Malaysian adults 25–64 years old according to ethnicity, 2005–2006

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Malay</th>
<th>Chinese</th>
<th>Indian</th>
<th>Other Burniputera</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total % (95% CI)</td>
<td>17.2 (14.4-20.5)</td>
<td>12.1 (8.6-16.8)</td>
<td>19.9 (14.7-26.5)</td>
<td>14.6 (10.8-19.3)</td>
<td>19.5 (10.0-34.8)</td>
</tr>
<tr>
<td>Men % (95% CI)</td>
<td>14.7 (10.9-19.5)</td>
<td>13.2 (7.8-21.4)</td>
<td>11.8 (6.4-20.9)</td>
<td>12.8 (8.1-19.8)</td>
<td>15.8 (6.1-35.0)</td>
</tr>
<tr>
<td>Women* % (95% CI)</td>
<td>20.1 (16.3-24.5)</td>
<td>10.9 (7.6-15.4)</td>
<td>25.7 (18.4-34.7)</td>
<td>16.8 (11.6-23.7)</td>
<td>22.6 (8.6-47.7)</td>
</tr>
</tbody>
</table>


In New Zealand, the prevalence of obesity among adults in various ethnic groups differs significantly, ranging from 14% among the Asian population to 67% among the Pacific population. Pacific adults were 1.5 times more likely to be obese than non-Pacific adults, whereas Asian adults were 50% less likely to be obese than non-Asian adults (124). In Singapore, there are significant differences in obesity rates between adults in different ethnic groups and these differences have increased over time (Fig. 14) (130).

**Fig. 14. Prevalence of obesity (BMI ≥30) according to ethnicity in adults 18–69 years old in Singapore, 1992–2010**

[Image of graph showing prevalence of obesity by ethnicity in Singapore from 1992 to 2010.]

Source: Singapore Ministry of Health – Epidemiology and Disease Control Division (130).

The large disparities in overweight and obesity between different ethnic groups require further context-specific analysis to explore the reasons behind such disparities, for example, if the disparities in overweight or obesity reflect the socioeconomic inequities between ethnic groups. Existing studies give an indication of different exposure to unhealthy food environments for the various ethnic groups. For example, a 2014 study in Malaysia showed variations in food advertisements in ethnicity-specific TV channels, with popular channels for children of Indian origin having the lowest rate of food advertising in comparison to other ethnic groups (Chinese and Malay) (60). Evidence from other regions shows similar trends. In the United
States of America, a 2008 systematic review showed that “advertisements for low-cost, high-calorie, and low-nutrition food and beverage products are more frequent in media targeted to African Americans” (131). Another study in 2009 showed that those living in an upper-income neighbourhood are generally less exposed to most types of obesity-related marketing [unhealthy foods and beverages, sedentary entertainment and transportation], while low-income black and Hispanic-concentration neighbourhoods have a higher concentration of billboards for fast-food and sugar-sweetened beverages (111) [see Box 2].

It is important to assess the disparities in overweight and obesity in the larger socioeconomic context and position where different ethnic groups live (132), including consideration of differential exposure to obesogenic environments and barriers to healthy foods, physical activity, health care and health education.

3.5. Overweight and obesity by geographical region within countries

Data on childhood overweight or obesity disaggregated according to geographical region within country are available for 10 countries in the Region: Cambodia (77), Fiji (77), the Lao People’s Democratic Republic (77), Mongolia (133), Papua New Guinea (77), the Philippines (77), Solomon Islands (81), Tonga (82), Vanuatu (77) and Viet Nam (77).

Large disparities between geographical regions were identified in many countries, for example in Cambodia [Fig. 15], despite the overall low prevalence of childhood overweight or obesity in the country. In Fiji, Papua New Guinea [Fig. 16], Solomon Islands, Vanuatu and Viet Nam [Fig. 17], the difference between the regions with the lowest and the highest prevalence rates is around five-fold.

Fig. 15. Prevalence of overweight or obesity (weight-for-height >+2SD) in children under 5 years in different regions of Cambodia, 2011–2012

Source: WHO Global Database on Child Growth and Malnutrition (77).

14 6.7% in the Central region vs. 1.3% in the Northern region.
15 5.6% in Malaita vs. 0.9% in Guadalcanal.
16 8.6% in Port Vila vs. 1.8% in Sanma.
In Viet Nam, the south-eastern region is particularly affected by the double burden of malnutrition, with similar rates of childhood stunting (10.9%) and overweight (10.5%), while in rest of the country stunting is remarkably more prevalent (Fig. 17). This might be partly explained by Ho Chi Minh City being located in the south-eastern region of the country, since the prevalence of overweight in Viet Nam is considerably higher among urban children and the level of stunting is generally higher in rural areas.

Source: WHO Global Database on Child Growth and Malnutrition (77).
In Mongolia, regional differences in prevalence of childhood overweight are relatively small but when overweight prevalence across regions is compared to those of stunting, clear differences can be seen in the nutrition situation of the regions (Fig. 18). For example, in the capital of Ulaanbaatar, overweight is considerably more prevalent than stunting, whereas in the remote Western region stunting is twice as prevalent as overweight, while overweight is still common.

![Fig. 18. Regional differences in prevalence of overweight and stunting in children under the age of 5 years in Mongolia, 2013](image)

Data are scarcer for adults and adolescents. In Malaysia, there are significant differences in prevalence of obesity among adults between different states, ranging from 8% in Terengganu state to 55% in Pulau Pinang state (129). Some differences were observed in the prevalence of overweight or obesity among school-attending adolescents 13–15 years in the Philippines by geographical area (7.3% in Visayas in the central Philippines, 10.9% in Luzon in the north and 11.3% in Mindanao in the south) (134–136).

Regional differences in the prevalence of overweight or obesity might be due to the differences in the socioeconomic contexts, level of urbanization or remoteness, availability of services, or ethnic and demographic profile of the particular region, among other things. For example, in Mongolia and Vanuatu, the highest prevalence of overweight or obesity among under-5 children are observed in regions that are urbanized, whereas in Cambodia, the prevalence is highest in Otdar Mean Chey, which is a remote, rural and underdeveloped region in the north-western corner of the country, near the border of Thailand. The data from the Western Pacific Region show large disparities in overweight and obesity across different geographical areas within countries but do not show a clear pattern how these disparities might be explained. This highlights the importance of context-specific consideration of nutrition challenges in different geographical areas and the reflecting policies and programmes within countries.
4. Addressing the drivers for inequities on overweight and obesity

Reducing inequities in overweight and obesity requires a comprehensive approach to their social determinants, including policies that target both prevention and management, and that focus on ensuring social justice and diminishing the accumulated disadvantage suffered by the most vulnerable populations.

Addressing the social gradient requires a combination of universal and targeted measures that offer extra support to those with the greatest disadvantage and need, as well as mixing short- and long-term interventions to address the five dimensions in which inequities may be manifested: socioeconomic context and position, differential exposure, differential vulnerability, differential health-care outcomes and differential consequences (Fig. 3). Table 4 provides an overview of potential interventions or policies that can help reduce inequities in health.

Table 4. Interventions to tackle health inequities and their determinants

<table>
<thead>
<tr>
<th>Policy category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service responsiveness</td>
<td>Modifying the way that services are provided in order to make these better</td>
</tr>
<tr>
<td></td>
<td>correspond to the needs of and usability for certain population groups with</td>
</tr>
<tr>
<td></td>
<td>the aim of reducing the differential in health-care outcomes experienced by</td>
</tr>
<tr>
<td></td>
<td>these groups, including those affected by overweight and obesity and related</td>
</tr>
<tr>
<td></td>
<td>illness.</td>
</tr>
<tr>
<td>Service access</td>
<td>Reducing barriers to access of selected health-care services for certain</td>
</tr>
<tr>
<td></td>
<td>population groups in order to reduce their differential vulnerability, including</td>
</tr>
<tr>
<td></td>
<td>making services available, removing or reducing fees, etc.</td>
</tr>
<tr>
<td>Policy/legislation</td>
<td>Regulating the availability and control of services, resources and commodities</td>
</tr>
<tr>
<td></td>
<td>such as unhealthy food and non-alcoholic beverages with the aim of modifying</td>
</tr>
<tr>
<td></td>
<td>the socioeconomic context and position determinants of health.</td>
</tr>
<tr>
<td>Norm change</td>
<td>Addressing differential exposure by modifying what the society formally or</td>
</tr>
<tr>
<td></td>
<td>informally encourages or discourages, for example, in terms of what to eat,</td>
</tr>
<tr>
<td></td>
<td>and what women can or cannot do, such as physical activity.</td>
</tr>
<tr>
<td>Community empowerment</td>
<td>Handing over control of institutions and/or public funds in full or in part,</td>
</tr>
<tr>
<td></td>
<td>for example, from civil service structures to communities, thus involving</td>
</tr>
<tr>
<td></td>
<td>some transfer of power and control with the potential to reduce differential</td>
</tr>
<tr>
<td></td>
<td>exposure.</td>
</tr>
<tr>
<td>Community development</td>
<td>Releasing the potential within communities to make them take things in their</td>
</tr>
<tr>
<td></td>
<td>own hands and thereby reducing group or individual differential vulnerability</td>
</tr>
<tr>
<td></td>
<td>It involves provision of information, training and, in some cases, loan</td>
</tr>
<tr>
<td></td>
<td>opportunities and direct injection of resources.</td>
</tr>
<tr>
<td>Commodity access</td>
<td>Reducing barriers to access of commodities such as healthy foods, thus</td>
</tr>
<tr>
<td></td>
<td>aiming to modify the differential vulnerability. This includes making these</td>
</tr>
<tr>
<td></td>
<td>available at subsidized prices, for example.</td>
</tr>
</tbody>
</table>

Source: Adapted from Blas et al. 2011 (23)
Reviewed interventions in previous WHO publications [23,31] indicate that successful interventions have the following features:

- receive long-term funding
- are multicomponent interventions, focusing on a range of determinants
- include capacity-building components
- include community participation
- include education on health, nutrition and physical activity
- adopt adequate screening to identify the most vulnerable
- promote systemic change.

Countries in the Region have very different experiences and capacities to address inequities in overweight and obesity; therefore, a stepwise approach, tailored to the country context, can be used to start action regardless of the starting point [Fig. 19]. Countries should start by collecting disaggregated data by relevant social stratifiers to analyse the extent of inequities in overweight or obesity and the related risk factors, and to identify priority areas and vulnerable groups in order to formulate evidence-based policies [137]. Countries also need to ensure that existing policies do not worsen existing inequities, followed by strategies to address and reduce such inequities and to eliminate the social gradient across the whole population.

Fig. 19. A STEPwise approach to reducing inequity in overweight and obesity

Collect and analyse disaggregated data.  Ensure policy choices do not make inequities worse.  Focus on addressing health consequences for most disadvantaged.  Reduce the gap between most advantaged and most disadvantaged.  Seek to flatten the gradient across the whole population.

Source: Adapted from Loring and Robertson 2014 [31].
Policy-makers must ensure that the “do no harm” principle is adopted, so that inequities are reduced – and not widened. This requires special attention in crafting interventions based on the needs of different groups and evaluating impact of interventions on different groups. Social marketing and educational campaigns can, for instance, widen the social gap unless accompanied by structural support to enable low-income groups to both receive and comprehend the messages and act upon them. Lack of money to purchase healthier food and low education and literacy levels may prevent disadvantaged groups from equally benefiting from such campaigns. Additionally, Robertson et al. documented that reformulated processed foods cost more than their non-reformulated equivalents in Europe, for example beef burgers with 5% fats in comparison to those with 15% fats and cakes with additional dietary fibre, indicating that those in the lowest income groups will most likely benefit less from such interventions [138].

Box 3. Tailored social marketing campaign to promote physical activity among women in Tonga

Women in Tonga are more sedentary and obese than men due to a range of cultural and socioeconomic factors – such as the fact that sporting activities are often designed for and dominated by men. To address the issue, the Tongan Government, with the support of the Australian Sports Outreach Program, joined with the Tonga Netball Association and implemented a strategic health communication campaign, intended to understand the perspective of the target audience and to promote physical activity as “easy, exciting, enjoyable and everywhere”.

The campaign, targeted at women and branded Kau Mai Tonga: Netipol (Come on Tonga, let’s play netball), was launched in June 2012, and used netball as a means of encouraging sport for women. Since then, the campaign has been conducted annually, with phases of community mobilization, large-scale advertising and communication, and interpersonal education. Women’s participation in the initiative increased from 215 women to over 4000 women of all ages since its inception.

Source: WHO Global Status Report on Noncommunicable Diseases 2014(3) and Kau Mai Tonga (website) [139].
4.1. Policy options

Several policy options to address overweight and obesity have emerged from the 2004 Global Strategy on Diet, Physical Activity and Health to the more recent Report of the Commission on Ending Childhood Obesity in 2016. However, limited attention has been given to specificities related to inequities related to overweight and obesity. Any policy option must take into account the context in which various socioeconomic groups and ethnic minorities live and the barriers they face adopting healthy diets and adequate physical activity, and promote activities tailored to their specific needs. Therefore, the following section indicates interventions to address overweight and obesity in the five dimensions in which inequities may be manifested (as proposed by the Commission on Social Determinants of Health, see Figure 3).

Improving socioeconomic context and position to prevent overweight and obesity

At the national level

• Ensure social protection and employment policies, including a minimum wage that is sufficient for a healthy food basket.
• Promote social justice and equity through broader social policies that promote income distribution and raise incomes of the poorest groups, including cash transfers, vouchers and redistributive taxation.
• Develop legislation to restrict marketing to children of food high in fats, free sugars and salt, and sugar-sweetened beverages.
• Develop guidelines and standards for food reformulation to support manufacturers in making healthier products available at affordable prices. This includes the elimination of trans fats and the reduction of levels of total energy, fats, free sugars and salt.
• Adopt comprehensive and easy-to-understand food and nutrition labelling in order to facilitate consumer awareness on healthier options for foods and beverages.
• Implement policies to lower the prices of healthy foods such as fruits and vegetables (through price subsidies or removal of the value added tax) and increase the prices of unhealthy foods (those high in fats, free sugars and salt) and sugar-sweetened beverages.
• Ensure adequate maternity leave, in accordance with, at a minimum, the standards set by the International Labour Organization’s Maternity Protection Convention 183, 2000 (140), to promote exclusive breastfeeding.

In schools

• Ensure that disadvantaged children have access to school meals that are nutritionally adequate, that respect their culture, traditions and preferences, and that include fresh, locally available foods, and, where needed, are available free of charge or on a subsidized basis.
• Make participation in physical activity a compulsory part of the school curriculum, as this may be the only physical activity children from disadvantaged groups may have access to.
• Make physical activity more attractive to those who need it most (depending on the local context, could be boys or girls), including activities in schools and in the community, through interventions targeted and tailored to their realities, perceptions and needs.
• Develop food standards for schools, including bans on vending machines, restrictions on marketing (including sponsorships) and bans on sugar-sweetened beverages.
• Encourage family farming, local production of fruits and vegetables, and school gardens to provide for school meals. Link them to nutrition education activities in schools.

In the community
• Promote tailored physical activity interventions for women, immigrant groups and ethnic minorities in the community.
• Promote active community participation by including public hearings and planning activities that engage representatives from the most disadvantaged groups in the development of policies and interventions.

Addressing differential exposures
• Restrict the marketing of foods high in fats, free sugars and salt and of sugar-sweetened beverages to children in different types of media, including but not limited to television, radio, magazines, social media, games and other online media.
• Ensure adequate food labels following international standards, along with the adoption of easy-to-read front-of-pack labelling schemes and accompanying nutritional education for groups with lower levels of health and nutrition literacy.
• Apply taxes to unhealthy products rich in fats, free sugars and salt and remove taxes from healthier substitutes, as a means to promote positive dietary effects among consumers with low incomes.
• Provide healthy meals in schools – where needed – free of charge or on a subsidized basis, and ensure that the most disadvantaged have full access to them.
• Ensure that school environments are free from unhealthy foods, including canteens, vending machines and also sports and cultural events in and around schools.
• Limit the presence of fast food restaurants, stalls or vendors in disadvantaged areas and around schools.
• Increase exposure to fresh foods through farmers markets, urban agriculture, and mobile and street vendors for fruits and vegetables, etc.
• Implement urban planning and transportation policies that promote safe physical activity and active transportation, including adequate lighting, footpaths, cycling lanes and sports facilities.
• Encourage policies to provide free access to recreation facilities in disadvantaged communities, for example using community halls, schools and churches, setting aside specific times for different groups if necessary.
Addressing differential vulnerabilities

- Improve self-esteem and reduce social isolation of low-income, ethnic minorities and young women, especially mothers, for example through counselling activities and social campaigns.
- Support and promote exclusive breastfeeding for all mothers, especially among those who are overweight or obese, and belong to ethnic minority households and those from the lowest socioeconomic quintiles.
- Consider gender roles and provide culturally appropriate and safe spaces for free physical activity that are acceptable to different groups, including women.

Addressing differential health outcomes

- Ensure universal health coverage (UHC), with extra support for the most vulnerable groups, adopting the principle of non-discrimination and removing financial barriers for users of health services.
- Provide community-based interventions for delivery of nutrition services, including for example actions for healthy diets and physical activity promotion in schools, religious temples, community facilities and others.
- Improve equity training for health staff, including gender and cultural sensitivity.
- Carry out equity-focused monitoring of routine performance of programme activities, including service delivery.
- Develop and implement culturally appropriate dietary and physical activity guidelines and interventions.

Addressing differential consequences

- Review current policies and procedures to reduce stigmatization and marginalization of those who are overweight and obese.
- Ensure adequate and non-discriminatory health services for overweight and obese people, through UHC and community-based interventions.
- Implement broad interventions to improve social inclusion of marginalized ethnic and socioeconomic groups.

Box 4. Making fruits and vegetables more affordable

Making fruits and vegetables more affordable and increasing taxation on foods rich in fats, free sugars and salt can promote healthier habits in various groups, including those with the lowest socioeconomic status, helping reduce health inequities. For example, economic modelling conducted in Denmark estimated that reducing taxes on fruits and vegetables by 25%, while at the same time increasing taxes on foods high in fats and free sugars by one third, is most favourable to people with low incomes.

Source: Loring & Robertson 2014 (31).
5. Conclusions and recommendations

Overweight and obesity are increasing in many of the 37 countries and areas in the Western Pacific Region, even those still facing significant burdens of undernutrition, illustrating that the Region is affected by the double burden of malnutrition. To date, the countries in the Region have not managed to halt the increase in overweight and obesity in children, adolescents and adults. Despite the commitments previously made for example with the Global Nutrition Targets, efforts to address childhood obesity is still lack an equity lens both in terms of understanding the problem and on proposing solutions. Countries in the Western Pacific Region are very diverse in population size and political, economic, social and cultural environments. The prevalence estimates of overweight or obesity among children under-5 as well as adults vary greatly across countries and areas, ranging from 1.9% in Cambodia to 17.3% in Tonga for under-5 children and from 19% in the Lao People’s Democratic Republic to 93.5% in American Samoa for adults.

Disaggregated data on overweight and obesity in the Region are limited. For example, information on childhood overweight or obesity data by sex was available for only 14 countries, and data by urban or rural residence for only 11 countries. Data by socioeconomic status and ethnicity are available for even fewer countries. Data on childhood overweight and obesity by differences within countries were available for 10 countries in the Region. Data on overweight and obesity among adults have been collected in most countries in the Region in the last 10–15 years, but are seldom disaggregated by residence, socioeconomic status, ethnicity and geographical region within a country. Disaggregated data on school-aged children and adolescents are even more limited.

There are significant disparities in the burden of overweight and obesity across various population groups and regions within different countries. Generally, urban populations have a higher burden of overweight or obesity; however, with increasing exposure to obesogenic environments in rural populations, this might change in the future. In HICs, overweight and obesity tend to be especially concentrated among disadvantaged populations, whereas in LMICs, overweight and obesity are still more common among the more affluent population groups. Thus, the social gradient of overweight partly depends on the level of economic development of the country. With fast economic development in many LMICs in the Region, the country-specific situations are likely to change and people in lower socioeconomic groups are likely to become more vulnerable to overweight and obesity, as has happened in many HICs. This would pose an additional challenge to the already burdened health systems in LMICs in the Western Pacific Region. Differences in the prevalence of childhood overweight or obesity in different geographical areas within countries are considerable in most countries. In some countries, for example Mongolia, the regional disparities correspond to the finding that urban children are more often overweight or obese than rural children, showing higher prevalence rates in regions with large urban populations. However, in some countries, for example Cambodia, the highest prevalence rate of under-5 overweight was found in remote, rural regions. This illustrates the
complexity of childhood overweight and its underlying causes and highlights the importance of thorough, context-specific analysis of the inequities.

It is important to consider the double burden of malnutrition, present in most countries in the Western Pacific Region. Within countries, the burden of undernutrition and overweight or obesity affects various groups or areas to a different extent. For example, in Mongolia and Viet Nam, children in the regions with a high level of urbanization, overweight and obesity are becoming the biggest nutritional challenge, whereas in more remote rural areas, undernutrition is still much more prominent. In some settings, the most disadvantaged groups have the biggest burden of both stunting and overweight or obesity, as observed among the Hmong–Mien and Chinese–Tibetan children in the Lao People’s Democratic Republic.

Inequities in the burden of overweight or obesity among different population groups and areas are due to differences in, for example, socioeconomic context and position, and exposure and vulnerability to obesogenic environments. For example, availability and access to energy-dense but nutrient-poor foods and beverages combined with barriers to engage in physical activity might be more common in urban settings. At the same time, socioeconomic disparities affect the access to and choices of food consumed. The pattern of inequities in overweight or obesity seems to partly depend on the status of economic development of the country. For example, in HICs in the Region, the burden of overweight or obesity is heaviest among men and the socioeconomically most disadvantaged populations, whereas in the LMICs, women and people with the highest socioeconomic status are more often overweight or obese. It is important to assess and consider the context-specific inequities and their potential underlying causes.

Continuous surveillance of overweight and obesity trends, as well as related factors, is important. Data should be disaggregated in order to identify vulnerable or disadvantaged groups and areas. This allows programmatic responses to be designed and refined based on the needs of vulnerable groups and areas, potentially improving the overall effectiveness of the programmes.

The great challenge with overweight and obesity is that the underlying causes are a complex set of processes that relate to different sectors as well as the activities of diverse stakeholders, including the private sector. Policy-makers and programme managers should first ensure that policies and programmes do not further widen the existing inequities and secondly aim to reduce those inequities. This requires that decision-makers are aware of the linkages between the different environments people live in and their effect on health and nutrition. Furthermore, policies and programmes should be based on context-specific analysis of the disparities between boys and girls, men and women, urban and rural populations, rich and poor populations and different ethnic groups and populations in different regions in the country and their underlying causes. A multisectoral approach, including for example the health sector, agriculture, the market sector, food production, the education sector, urban planning, and transport, is crucial in tackling and preventing the challenge of overweight and obesity.
5.1. **Key policy recommendations**

The following recommendations build on existing policy options (including those proposed by the WHO Commission on Ending Childhood Obesity), and add to them an equity perspective.

1. Universal policies that cover the entire population are important, but extra measures are needed to ensure that the more disadvantaged groups can get their share of benefits from these policies, such as:
   a. interventions that improve self-esteem and address the lack of nutrition literacy and related skills and that also consider the needs and perceptions of disadvantaged groups; and
   b. school- and home-based interventions to improve healthy habits in childhood, increasing acceptability of fruits and vegetables, and restricting consumption of highly processed foods and sugary drinks, especially in low-income communities.

2. For disadvantaged groups, combine social protection measures with health actions, ensuring a minimum income for buying a healthy food basket, cash transfers and vouchers, in addition to adequate and affordable health care to ensure healthy weight gain and optional growth. Link conditional cash transfers to health services.

3. Ensure universal health coverage with adequate and affordable nutrition services that include prevention and management of overweight and obesity.

4. Use participatory methods to identify and address the needs and perceptions of the disadvantaged, involving marginalized and lower socioeconomic groups in the design, delivery and evaluation of services.

5. Support mothers to breastfeed through maternity protection legislation that ensures paid leave, support to and information on breastfeeding and complementary feeding, tailored to the specific needs of disadvantaged mothers.

6. Aim to provide a healthy food environment with restricted marketing of unhealthy options, in which it is easier, and possible, for all groups in society to have a healthy diet and regular physical activity.

7. Provide healthy school environments, with restricted marketing in schools and healthy school meals and regular and compulsory physical activity as part of the school curriculum, to create good habits in boys and girls.

8. Develop social marketing and educational activities on nutrition that are targeted to those from disadvantaged groups, in terms of literacy level, gender and cultural aspects.

9. People from lower-income households are more price sensitive than those from higher-income households; therefore, combining price subsidies for fruits and vegetables with taxation of foods high in fats, free sugars and salt is an intervention likely to reduce inequities.

10. Ensure that surveys and monitoring and evaluation systems collect and analyse data that are disaggregated by relevant social stratifiers, such as sex, ethnicity and area of residence, to reflect the situation and needs of different groups and use the results of such analysis in policy and programme design.
RESOURCE BOX

Equity, social determinants of health and public health programmes
http://apps.who.int/iris/bitstream/10665/44289/1/9789241563970_eng.pdf

Handbook on health inequality monitoring with a special focus on low- and middle-income countries
http://apps.who.int/iris/bitstream/10665/85345/1/9789241548632_eng.pdf

Tools and approaches for assessing and supporting public health action on the social determinants of health and health equity
http://www.ncchpp.ca/docs/Equity_Tools_NCCDH-NCCHPP.pdf

Urban Health Equity Assessment and Response Tool [Urban HEART]
http://www.who.int/kobe_centre/measuring/urbanheart/en/

Social determinants approaches to public health from concept to practice
http://www.who.int/social_determinants/tools/SD_Publichealth_eng.pdf

Integrating poverty and gender into health programmes: A sourcebook for health professionals. Module on nutrition
http://www.wpro.who.int/publications/docs/Nutritionmodule2.pdf

Integrating poverty and gender into health programmes: A sourcebook for health professionals. Module on noncommunicable diseases
http://www.wpro.who.int/publications/docs/MODULEONNCD.pdf

Focusing on obesity through a health equity lens. A collection of innovative approaches and promising practices by health promotion bodies in Europe to counteract obesity and improve health equity

Resource of health system actions on socially determined health inequalities
http://data.euro.who.int/equity/hidb/

Action:SDH. A global electronic discussion platform and clearing house of actions to improve health equity through addressing the SDH
http://www.actionsdh.org

Health inequalities impact assessment. An approach to fair and effective policy making, Guidance, tools and templates
RESOURCE BOX

Methodological guide to integrate equity into health strategies, programmes and activities

Equity in health project - Interactive atlases

Moving forward equity in health: monitoring social determinants of health and the reduction of health inequalities
References


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105. World Health Organization, Regional Office for the Western Pacific. Noncommunicable disease risk factors and socioeconomic inequalities - what are the links?: a multicountry analysis of noncommunicable disease surveillance data : report to the WHO Regional Office for the Western Pacific. Manila: WHO Regional Office for the Western Pacific; 2010.


137. Integrating Poverty and Gender into Health Programmes A Sourcebook for Health Professionals - Module on Nutrition. Manila, Philippines: World Health Organization Regional Office for Europe; 2010.


