# Preventing child obesity and promoting child health

## Situation analysis and roadmap for WHO EMRO

*"Creating the conditions for healthy growth and a health-promoting economy"*

## Summary

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Child obesity in the Eastern Mediterranean region has reached epidemic proportions and shows no sign of declining. The rapid rise – within the last 30 years – adds to the pre-existing burden of under-nutrition experienced by many member states. While the causes are complex and multi-layered, the effects are relatively easy to describe: a high risk of chronic disease in adulthood, reduced educational attainment and social disadvantages in childhood, and an overall burden on the economy through increased diversion of resources to health care, reduced productivity in the general workforce, and consequent undermining of family financial security.

Child obesity can be prevented. The multiple influences on a child's growth – including food supplies and adequate nutrition, freedom from infectious disease, plentiful physical activity, and training and education for healthy behaviour patterns – can all be shaped by policies at community, national and international levels. The present document addresses these policy areas, and identifies the need for stronger action in specific areas: enhanced surveillance of the drivers of disease, the development of tools to assist in policy-making, a set of key investments in child health through the life course, and the need to strengthen leadership on these issues in order to tackle the potentially conflicting interests of economic growth, commercial market development and health protection.

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This document has been prepared for WHO EMRO by Dr Tim Lobstein, Policy Director of the International Obesity TaskForce (IOTF). IOTF is a component of the International Association for the Study of Obesity, a non-governmental organisation in official relations with WHO.



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## 1 Child obesity – adding to the burden of nutrition-related disease in childhood.

### (a) Child obesity and overweight – facts and figures

A rise in the prevalence of overweight and obesity among children and adolescents occurred in the last half of the twentieth century in virtually every country of the world. On the basis of surveys in some of the EMRO member states, child obesity has increased dramatically in the wealthier countries within a generation ([1, 2]) with, for example, Saudi Arabian boys rising from 3% overweight to 25% overweight in just 17 years, 1988-2005 ([3]).

Measured surveys of adolescents undertaken in 2010-2011 in seven cities in the region ([4]) show the lowest prevalence in Palestine (17% of adolescents) and the highest rate also, in Kuwait City (over 50% of adolescents) (Table 1).

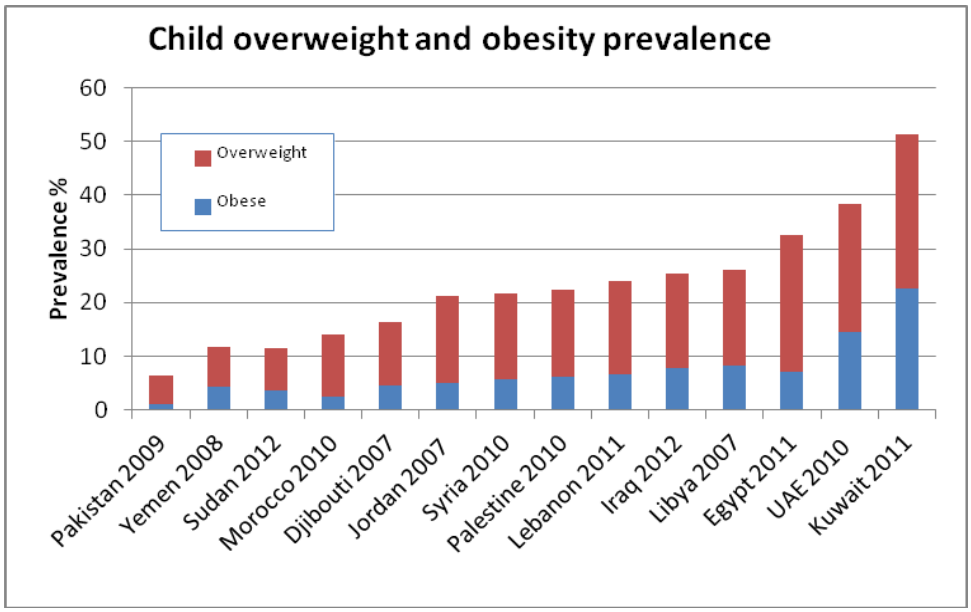
**Table 1 Proportion of adolescents aged 15-18 years who were overweight**

| | Boys | Girls |
|---|---|---|
| Al-Khalil, Palestine | 18% | 16% |
| Tripoli, Libya | 26% | 37% |
| Damascus, Syria | 27% | 25% |
| Amman, Jordan | 32% | 22% |
| Sharjah, UAE | 39% | 20% |
| Kuwait City | 60% | 41% |

Musaiger et al 2012

More extensive surveys, based on self-reported heights and weights, undertaken in many countries in the region show similarly high levels of overweight and obesity. The figure below (Figure 1) is derived from self-reported heights and weights in the Global School-based Student Health Survey, for children aged 13-15 years. Again, Kuwait shows the highest prevalence levels.

**Figure 1 Overweight and obesity prevalence in children 13-15 years**
Self-reported heights and weights



Source: GSHS country reports and fact sheets.

The problem is not restricted to adolescents. A survey of nearly 20,000 children in Saudi Arabia in 2005 found 12% of five-year-old children to be overweight, rising to over 27% by age 10 years, and continuing at this level through adolescence. In the Birjand province of Iran, 18% of kindergarten children aged 2.0-4.9 years were overweight or obese ([5]). By age 10 years, 39% of Kuwaiti boys were overweight or obese ([6]) although in Morocco the figure is below 9% ([7]).

### (b) Why excess weight is a problem

The correlates of child obesity in terms of ill-health in childhood and risk of disease in later adulthood are widely reported ([8, 9]). Obese children are at a raised risk of co-morbidities including type 2 diabetes, fatty liver disease, and endocrine and orthopaedic disorders with a high prevalence of risk factors for these diseases (Table 2). Overweight children enter adulthood with a raised risk of adult obesity of up to 17-fold (after adjusting for parental obesity) ([10]), and adult obesity in turn carries an increased likelihood of metabolic and cardio-vascular diseases, certain cancers and a range of other disorders including psychiatric problems ([11]). Even if subsequent weight loss is achieved and maintained, there is evidence that mortality rates are higher among those adults who had been obese as adolescents ([12]).

**Table 2 Estimated prevalence of chronic disease risk factors among obese children**

| | |
|---|---|
| Raised triglycerides | 22% |
| Raised total cholesterol | 22% |
| High LDL cholesterol | 19% |
| Low HDL | 19% |
| Hypertension | 22% |
| Impaired glucose tolerance | 8% |
| Hyperinsulinaemia | 34% |
| Type 2 diabetes | 0.5% |
| Metabolic syndrome (3+ criteria) | 24% |

| | |
|---|---|
| Metabolic syndrome (4+ criteria, age 10-18y) | 5% |
| Hepatic steatosis | 28% |
| Elevated aminotransferase | 13% |

Source: Lobstein and Jackson-Leach 2006[13]

Effective treatment for the majority of obese children and adolescents remains elusive, and obesity management, involving behaviour modification, family support, and lifestyle change are difficult to put into practice and may require the input of multi-disciplinary professional teams ([14]). Interventions which can maintain or improve health behaviour from an early age and which prevent long-term obesity are likely to be far more cost effective over the longer period than managing and treating obesity and obesity-related diseases after they have developed.

### (c) Continuing concern of under-nutrition

Child obesity is a relatively new concern in the region, and its emergence in the last two decades comes at a time when the problems of undernourishment continue and should be taken into account in any policies to tackle obesity. In Pakistan, stunting was found in 8% of school-age children ([15]). A recently-published survey of 70,000 pre-school children in North-east Iran found underweight, stunting, and wasting prevalence of 7.5%, 12.5% and 4.4% respectively ([16]). A 2009 survey of pre-school children in the Gaza Strip area of Palestine found 50% to be anaemic (of whom a quarter had parasitic infections), and 15% were stunted ([17]). In Egypt, the 2008 Demographic Health Survey found 29% of children under age 5 years to be stunted, an increase from 23% found in surveys in 2000 and 2005 ([18]).

It is important that the solutions adopted for tackling overweight and obesity do not inadvertently lead to a worsening or perpetuation of poor nourishment for any child. Care should be taken, especially with health education messages about overweight and obesity if these messages are likely to reach vulnerable families and lead to anxiety about over-feeding. Policies need to focus on the creation of healthier environments for all children, improving food and nutrition security[*] and promoting healthy feeding practices for mothers and infants, and healthy diets and physical activity practices for children of all ages. Population-based strategies which improve societal norms and standards and restrict marketing practices that undermine good nutrition should contribute to the creation of these health-promoting environments.

We should also note here that repeated bouts of infection in infancy are a major contributor to poor growth, and that a well-nourished child is likely to have better resistance to infection and better recovery from ill-health. There are therefore many advantages to be gained from improved nutrition security in promoting child health and subsequent economic development.

[*] The meaning of 'nutrition security' is discussed in Section 4(b) below, and includes protection of breastfeeding.

## 2 Trends in diet and physical activity

The recent rise in child overweight in the region, and especially in middle and higher income countries, has been matched by a number of changes in children's dietary and physical behaviours.

### (a) Dietary patterns

Breastfeeding rates are reported to be declining in the region ([19]) particularly in very recent years. Breastfeeding initiation is declining from high levels (for example, a 2005 survey in Saudi Arabia reported 91% of mothers initiating breastfeeding, down from 99% six years earlier ([20])), while estimates of exclusive breast-feeding at six months suggest this was occurring for 28% of infants in the region in 2007 ([21]), although it is a principle recommendation of the WHO's child health strategy. A survey in Saudi Arabia found 24% of mothers ([22]) had continued exclusive breast feeding to six months, while in rural Egypt, a 2010 survey found only 9% of mothers exclusively breastfeeding at 6 months ([23]). In Jordan, the rate reported in 2013 was just 1% ([24]).

Food consumption patterns and dietary habits have changed significantly in the region over the last 40 years, with increases in per-capita population consumption of calories and fats, and a move from traditional to western-type diets ([25]). Breakfasts of poor nutritional value are common among school-children, and significant numbers are missing breakfast altogether: 32% of children in UAE aged just 6-7 years said they missed breakfast completely, rising to 50% among children aged 10-15y in Bahrain, and 74% of girls in Saudi Arabia aged 12-16y ([26]).

In Saudi Arabia, Amin et al. ([27]) found that as eating outside the home increased in primary school children (6–11 years), the proportion of obesity increased. Among those who did not eat outside the home 9% were obese, while among those who ate outside the home more than 5 times per week 53% were obese.

Soft drinks including carbonated sugary beverages and sweet snacks are popular with children, even at a young age. Among children in Jordan aged 4-5 years, more than 50% consumed carbonated sugary beverages, and 71% regularly consumed biscuits and cakes, and 76% confectionery ([28]). These children also consumed high levels of desserts, squashes and tea with sugar.

Among older children, the Global school-based student health survey (GSHS) ([29]) indicates a high level of self-reported consumption of sugar-sweetened beverages, with the proportion of children saying that they consume at least one drink per day exceeding 60% in many countries in the region (Table 3).

**Table 3 Percentage of children 13-15y saying they consumed at least one carbonated soft drink per day, over the last 30 days.**

| Country | boys | girls |
|---|---|---|
| Egypt 2011 | 60 | 51.1 |
| Jordan 2007 | 40.5* | 35.6* |

| | | |
|---|---|---|
| Kuwait 2011 | 75 | 73.3 |
| Lebanon 2011 | 27.1 | 16 |
| Morocco 2010 | 42.8 | 48.6 |
| Pakistan 2009 | 28.3 | 49.3 |
| Palestine 2010 | 61 | 55.3 |
| Syria 2010 | 34.4 | 26.9 |
| UAE 2010 | 50.3 | 36.5 |

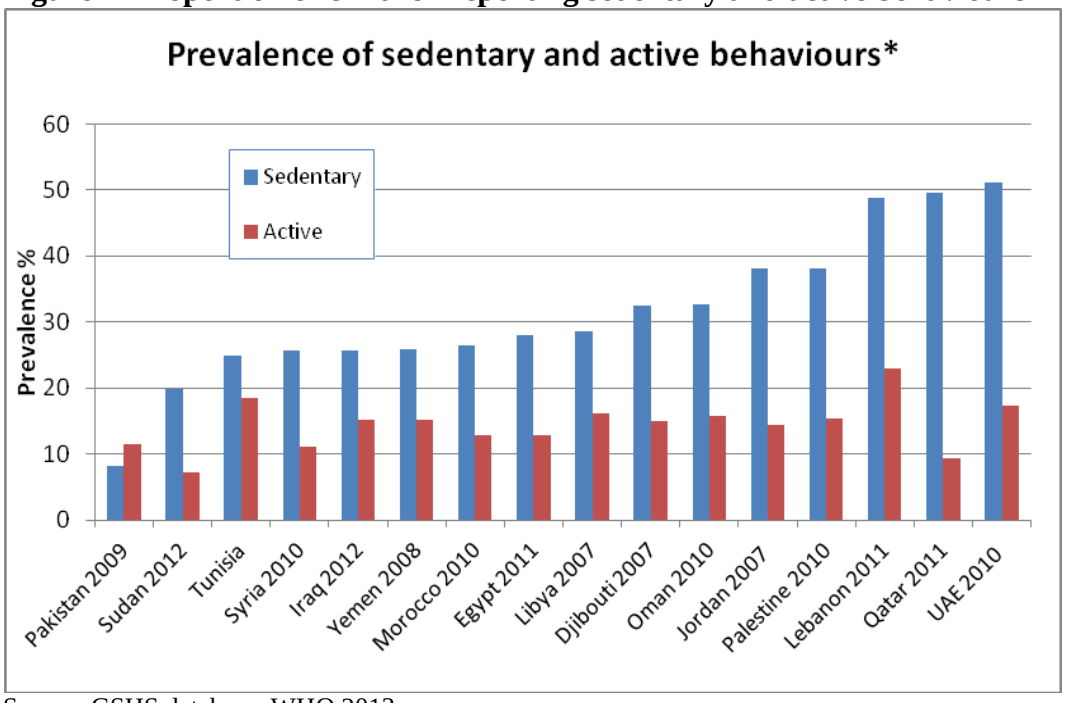
* At least two servings per day
Source: GSHS database, WHO 2013.

### (b) Physical activity and sedentary behaviour

Regional surveys find high levels of sedentary behaviour: for example, among Saudi adolescents 84% of boys and 91% of girls spend more than 2 hours on screen time daily and almost half of the males and three-quarters of the females did not meet daily physical activity guidelines ([30]). Girls were significantly more sedentary, and much less physically active than boys, especially with regard to vigorous physical activity.

The GSHS asked children if they took active physical activity for at least an hour, in at least five out of the seven previous days. The results show that in the large majority of countries at least 80% of children do not undertake regular physical activity (Figure 2). The survey also asked if the children spent more than three hours each day typically sitting, and found that on average a third of all children said 'yes', rising to over 50% of children in the UAE.

**Figure 2 Proportion of children reporting sedentary and active behaviours**



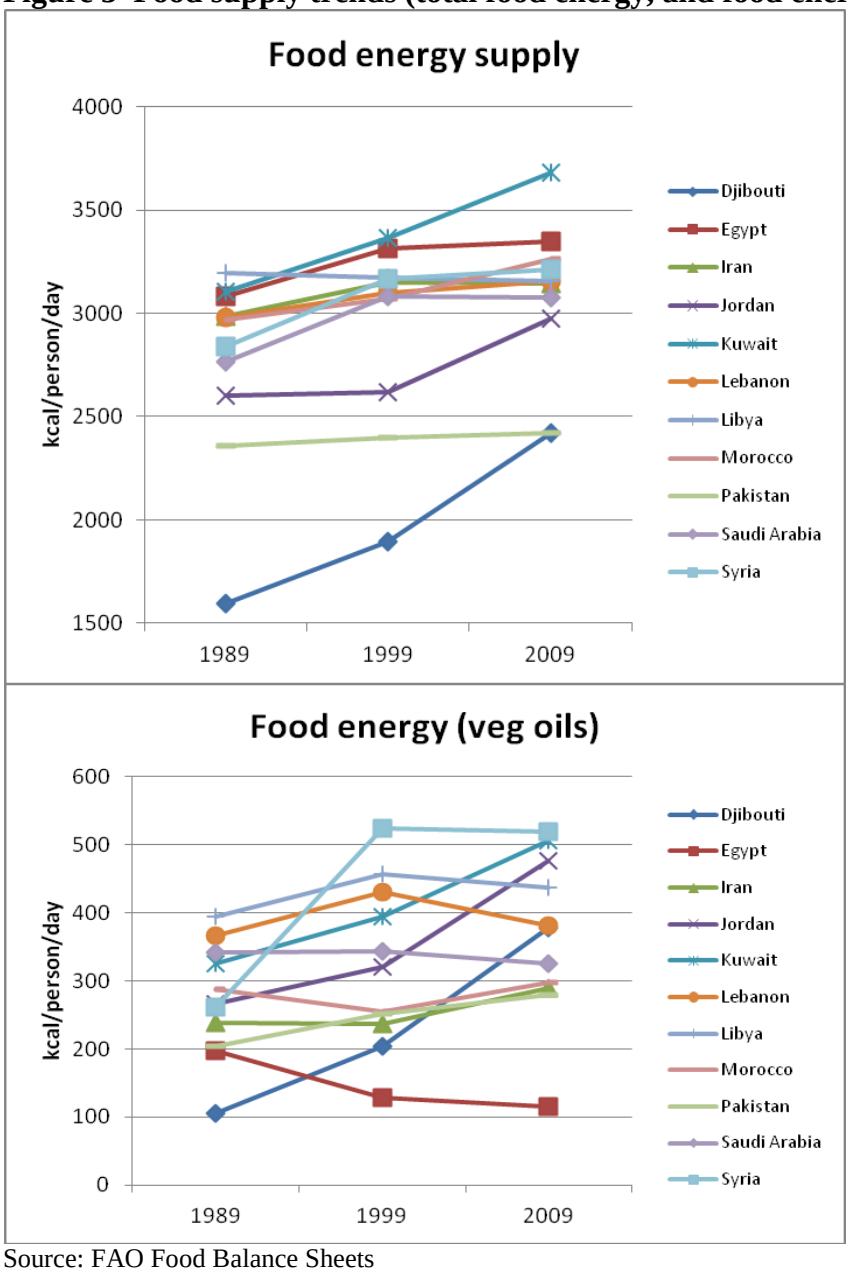
Source: GSHS database, WHO 2013.

# 3 Trends in food supplies and physical environments

## (a) Food supplies and food market data

The dietary data are matched by evidence from food supply and market data. The FAO Food Balance Sheets indicate a significant increase in food energy passing into consumption for several countries in the region, primarily due to rising fats from both animal and vegetal sources (Figure 3).

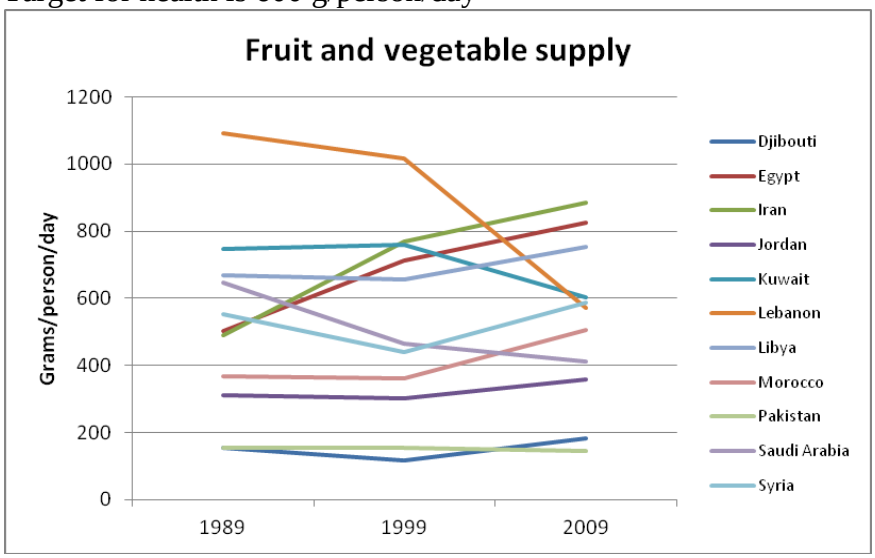
**Figure 3 Food supply trends (total food energy, and food energy from vegetable oils)**




Source: FAO Food Balance Sheets

Several countries – especially Lebanon, Kuwait and Saudi Arabia – show a significant decline in fruit and vegetable consumption (excluding potatoes) while others are maintaining and improving supplies (Figure 4). Note that a 600g supply is considered sufficient to provide 400g edible fruits and vegetables, the recommended target proposed in many food-based dietary guidelines.

**Figure 4 Fruit and vegetable supply trends**
Target for health is **600** g/person/day

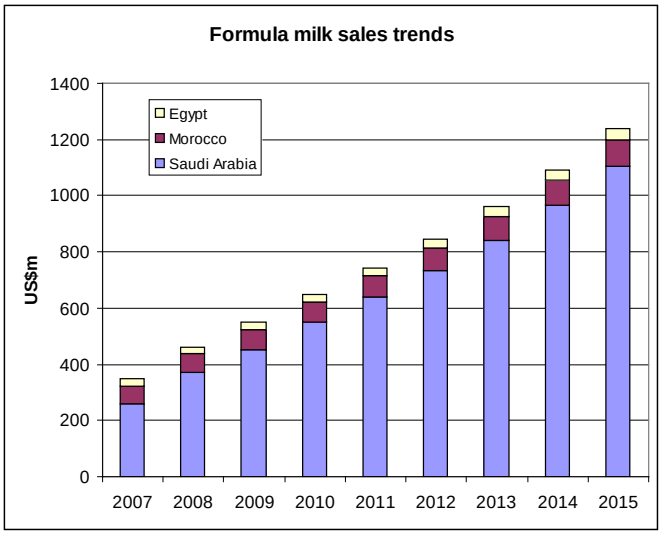



Source: FAO Food Balance Sheets

### *Foods for infants*

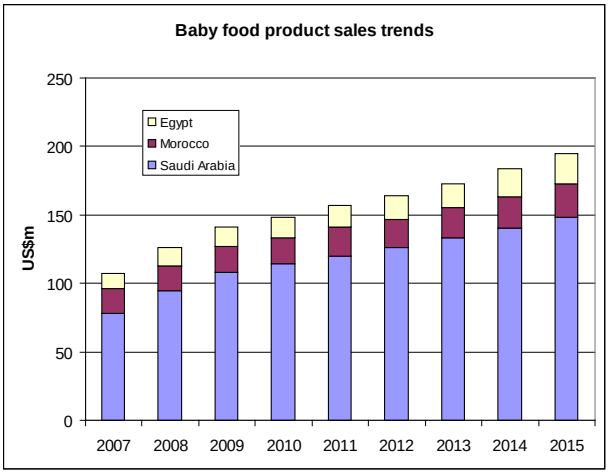
Figures for food market development in the region show an anticipated continuation of the steep increases in both formula milk sales and commercially produced baby food products.

**Figure 5 Formula milk sales in three developing markets**
Reported 2007-2010 and predicted 2011-2015




Source: Agriculture and Agri-Food Canada 2011 ([31])

**Figure 6 Baby food product sales in three developing markets**
Reported 2007-2010 and predicted 2011-2015

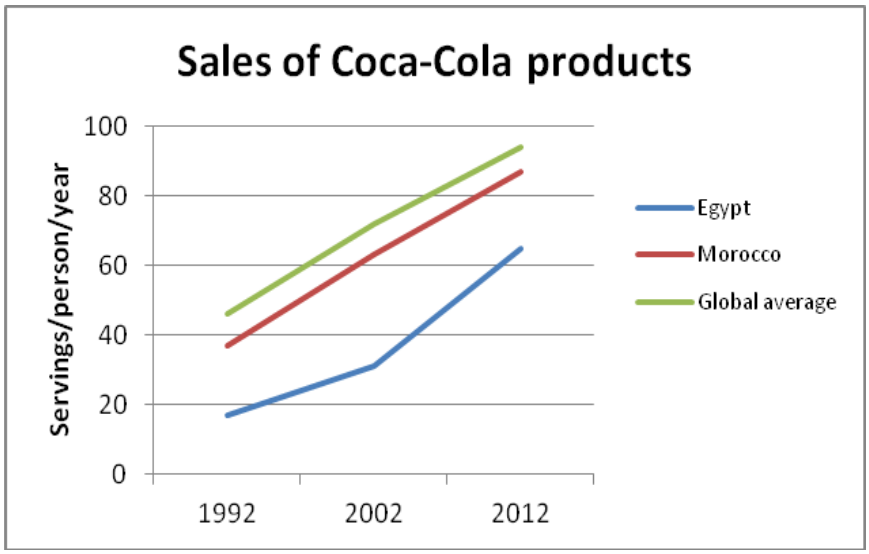



Source: Agriculture and Agri-Food Canada 2011

### *Soft drinks*

Data are not readily available except in commercial market analyses. Data from the Coca-Cola company indicate a rapid increase in sales of their products achieved in the last 20 years, in the Middle East, as in many parts of the world.

**Figure 7 Trends in Coca-Cola sales per person in selected countries**

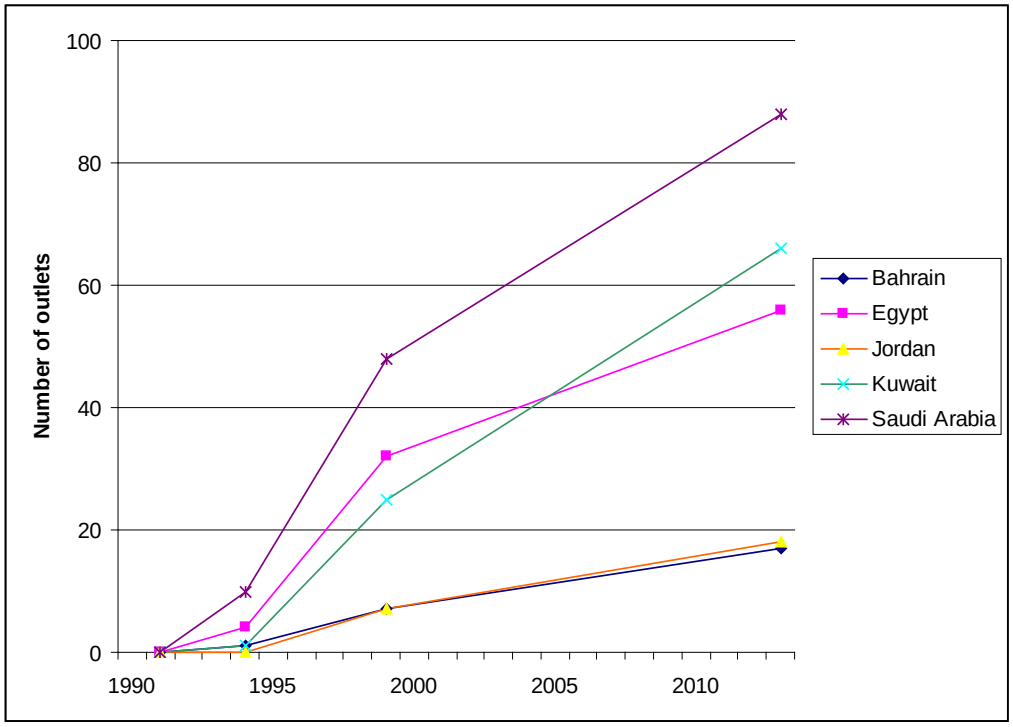



Source: Coca-Cola annual reports

***Fast food***

Market data from the leading fast food chain, McDonald's indicate a rapid expansion of their sales in the region. Figure 8 shows the number of fast service restaurants operating in several countries in the region in the last two decades.

**Figure 8 Trends in the number of McDonald's outlets 1990-2013**

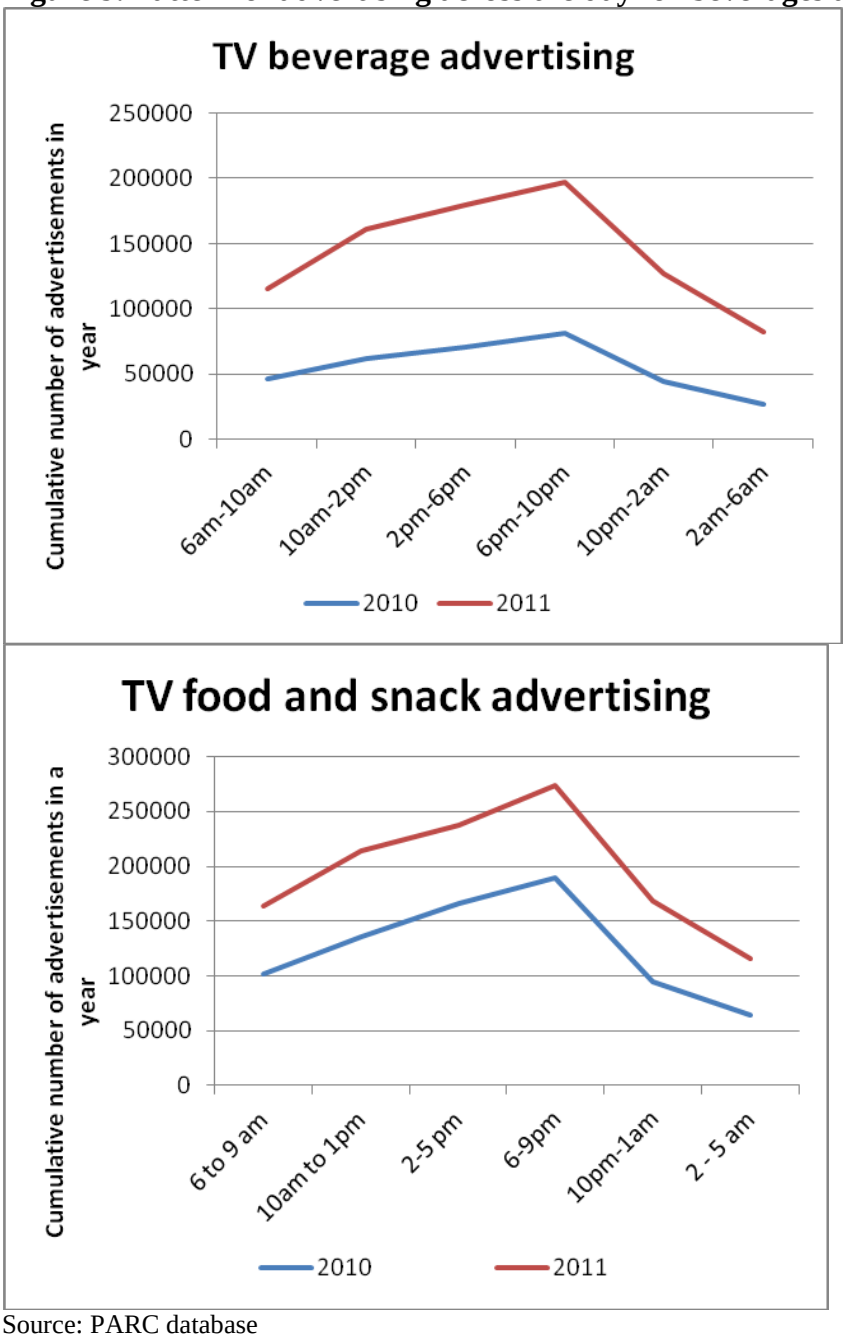



Source: McDonald's Inc Annual Reports and online information.

***Promotional marketing trends***

Expenditure on promoting energy-dense diets has grown considerably in the region in the last few years. Foods most frequently advertised are soft drinks (37% of TV advertising for food and beverages), followed by savoury snacks (24%), confectionery (21%) and fast foods (18%) ([32]). The two leading soft drinks companies spent US$334m on media advertising in 2011, rising to US$435m in 2012. The advertising of foods and beverages is largely undertaken on television, and during the period between 2pm and 9pm, when children are highly exposed (Figure 9).

**Figure 9. Pattern of advertising across the day for beverages and foods, including snacks**



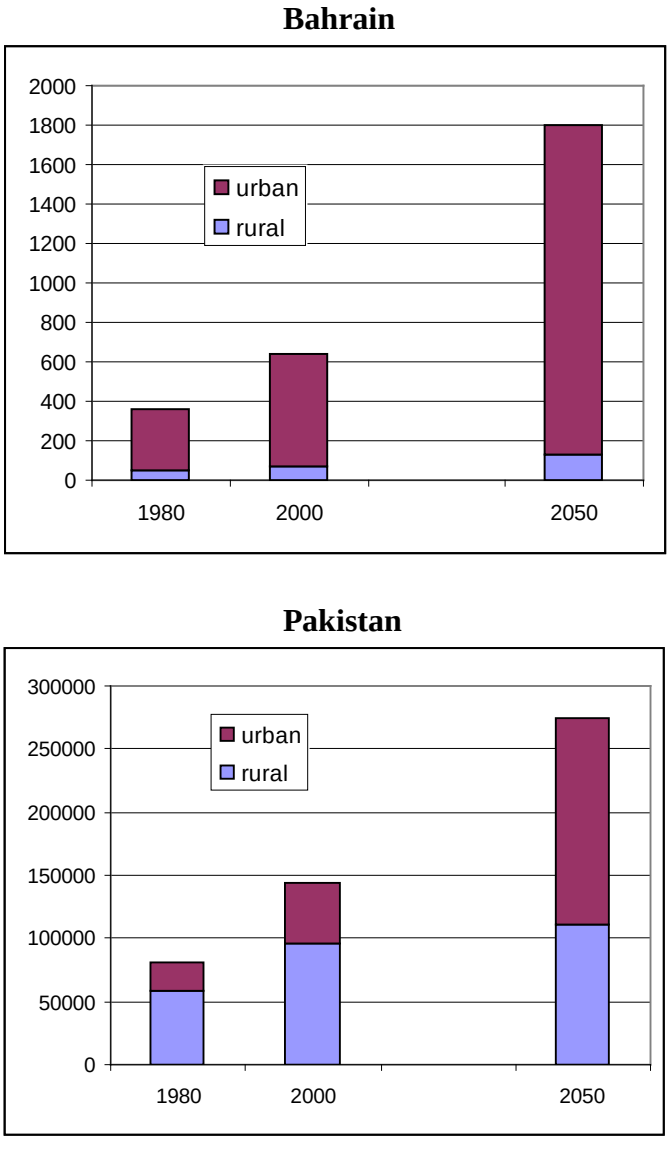

Source: PARC database

## (b) Physical environments and markets for sedentary products

### *Urbanisation*

The region has a very uneven distribution of population, with 92% of people living in just 3% of the surface area ([33]). Rapid urbanisation is found in several of the region's member states, with over 80% of the population living in cities in Bahrain and over 90% in Kuwait. Rural populations remain the majority in other member states, such as Pakistan, although this is predicted to change in the next three decades (Figure 10).

**Figure 10 Urban and rural population levels in 1980, 2000 and predicted for 2050.**
Population (thousands)




Source: World Bank online database.

### *Car ownership*

Active transport is increasingly replaced by personal use of motor vehicles. Car ownership in the Middle East region is reported at 119 vehicles per 1000 population in 2011, having risen from half that number, 57 per 1000, in 1996 ([34]).

However this average figure hides a very wide range. According to World Bank development indicators for available countries, passenger vehicle ownership in the period 2008-2010 ranged from 13 per 1000 in Pakistan and 20 per 1000 in Afghanistan, to 439 per 1000 in Kuwait and 450 per 1000 in Bahrain ([35]).

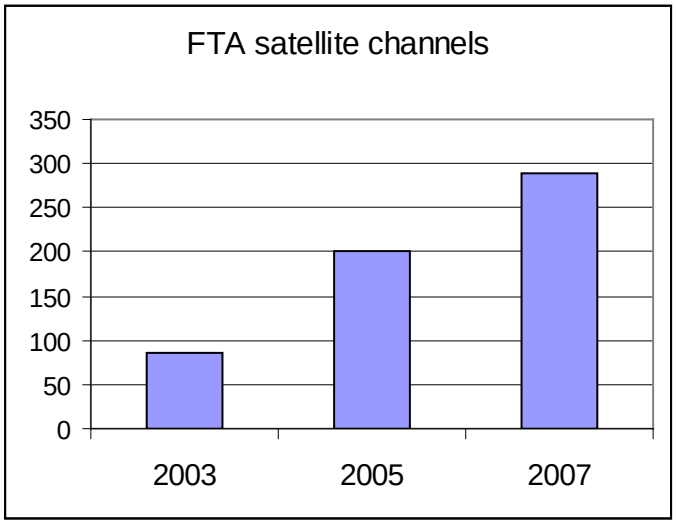
### *Electricity consumption*

An indicative measure of the use of labour-saving devices in the workplace and at home, and in entertainment, can be indirectly assessed by electricity consumption, for which figures are published by the World Bank ([36]). Consumption patterns vary widely, from 449 kWh per person in Pakistan to 16,122 kWh per person in Kuwait (figures for some countries are not available).

### *Television ownership and use*

An indicator of television usage is ownership. Figures for the proportion of households with a television show a range from 6.3% in Afghanistan to 98.7% in Saudi Arabia ([37]). Another measure of consumer demand is the number of channels available. The growth of free-to-air satellite channels in the region is shown below (Figure 11).

**Figure 11 Free-to-air satellite TV channels 2003-2007**




Source: Chahine G 2008 ([38])

# 4 Conceptual frameworks

In this section we discuss some of the concepts and language which are helpful in the discussion on policies for child obesity prevention. In particular, we consider the ecological approach to child obesity, which sets obesity in the context of the environments which encourage its development.

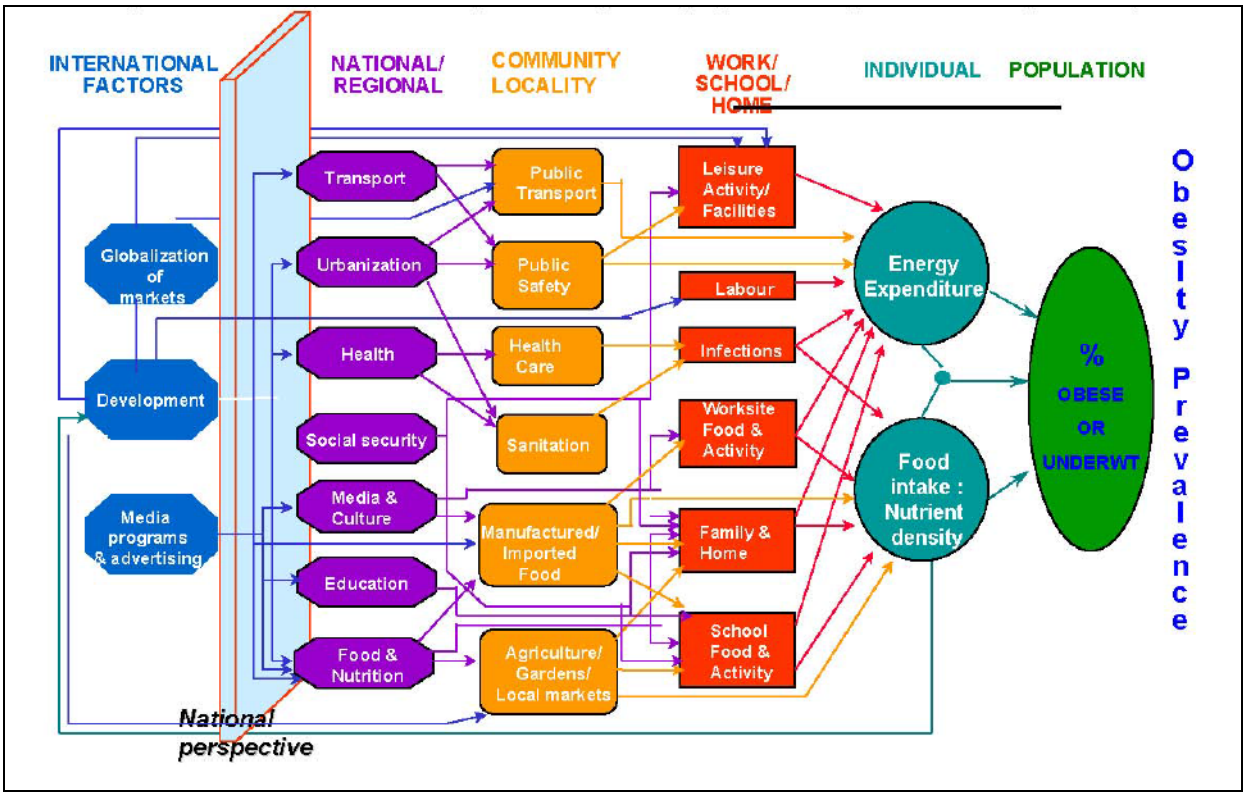
We then discuss the need to look at food supplies and go beyond the notion of food security to consider nutrition security, which explicitly includes not only supply but the consumption of nutritious foods, and the barriers which prevent this happening.

Lastly we re-consider the well-used phrase 'evidence-based' interventions and suggest that interventions at population are inevitably poorly supported by past evidence, and that an 'investment' approach acknowledging risk (lack of evidence) and return (likely impact and reach) may be more helpful to policy-makers.

## a Ecological models of health-promoting environments

The 'causal web' of influence on nutritional status (obesity and underweight) developed by the International Obesity TaskForce (IOTF), is shown below.

**Figure 12 The IOTF Causal Web showing distal and proximal influences on nutritional status**



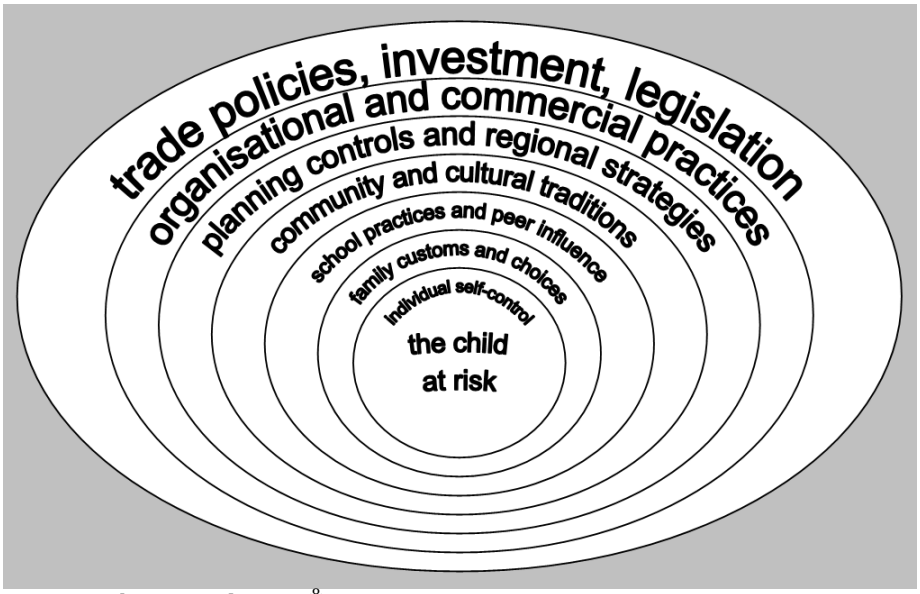

Source: http://www.iaso.org/site_media/uploads/IOTF_Causal_Web.pdf

IOTF has also considered the specific issues of child obesity and the ecological issues surrounding child obesity prevention, especially for school-age children. Their 2004 publication ([8]) suggested that children cannot be expected to bear the full burden of responsibility for preventing excess weight gain, and that the prevention of childhood obesity requires:

- improving the family's ability to support a child in making changes, which in turn needs support from the school and community, for example . . .

- ensuring primary care services are supporting healthy infant nutrition, and that kindergartens and schools have health-promoting policies on diet and physical activity, and that peer group beliefs are helping the child, which in turn requires that . . .

**Figure 13 The IOTF ecological model for child obesity prevention**




Source: Lobstein et al 2004 ([8])

- the cultural norms, skills and traditional practices transmitted by the school are conducive to health promotion, and that the community provides a supportive environment, such as . . .
- neighbourhood policies for safe and secure streets and recreation facilities, and ensuring universal access to health-enhancing food supplies, which in turn requires that . . .

- authorities at municipal, and regional level are supporting such policies, e.g. for safe streets and improved food access through appropriate infrastructure, and that . . .

- national and international bodies that set standards and provide services are encouraging better public health, and commercial practices consistently promote healthy choices, which in turn may require . . .

- legislative and regulatory support to ensure that strategies for obesity reduction are fully resourced and implemented, and appropriate control measures are enforced, and that these are not contradicted by other government policies, and that . . .

- government activities in all departments, including education, agriculture, transport, trade, the environment and social welfare policies are assessed for their health impact, and that commercial activities do not undermine health, and . . .

- government contracts and food purchases are consistent with supporting and strengthening markets for healthy food products and reduced sedentary behaviour. Lastly . . .

- governments should support inter-governmental agencies to ensure that cross-border trade and marketing do not undermine health policies.

## b Extending the definition of nutrition security

Nutrition security is more than food security: it is the supply *and consumption* of the optimum nutrition for growth, health and the prevention of later NCD. Determinants of nutrition security include determinants of food security (sustainable and adequate supplies, hygienic and consistent quality, widespread availability, affordable and accessible to all) but also determinants of consumer choice and consumption patterns, including household distribution of foods, cultural practices, education and skills, information, product labelling and persuasive marketing practices, and whether these are promoting or impeding healthy dietary behaviour and optimum nutrition for each individual. By looking at these wider determinants, nutrition security takes into account cross-cutting issues such as life course phases and social inequalities.

Nutrition security for an infant includes the nutrition security of the mother before and during pregnancy and the protection of exclusive breastfeeding for the first six months and appropriate complementary feeding[†] thereafter.

Similarly, physical activity security implies the supply *and use* of the optimum environments for active behaviour (green spaces, safe play, active transport facilities, widely available, affordable and accessible to all) but also ensuring the favourable determinants of their use, including cultural practices, social pressures and stigmas, education and skills, information, product labelling and persuasive marketing practices, and whether these are promoting healthy activity or undermining it, for example through the promotion of sedentary behaviours: sedentary games and entertainments, screen-watching.

[†] The definition of 'appropriate' in the context of complementary feeding is currently being examined by the WHO Department of Nutrition for Health and Development, Geneva.

BOX
***Rights to food and nutrition***

The United Nations Special Rapporteur on the Right to Food defined the right to food:
*"The right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensure a physical and mental, individual and collective, fulfilling and dignified life free of fear"*.

At the 19$^{th}$Session of the Human Rights Council: Interactive Dialogue with the Special Rapporteur on the right to food (6 March 2012), the Rapporteur highlighted three main ideas:

(1) Malnutrition cannot be fully attributed to 'life choices'; it is a structural issue given that the wider environment created by policy (e.g. agricultural production) is conducive to overconsumption, unhealthy food, overweight and obesity;

(2) The globalization of the agro-food chain through international trade and investment is a major challenge, especially in developing countries;

(3) awareness-raising on nutritious food does not compare with the marketing practices of the food industry, particularly sweet drinks, snacks, fast food targeted at children. In conclusion, he recommended re-examining agricultural policies, taxing certain unhealthy foods and drinks, promoting breastfeeding (incl. implementation of the WHO code), tackling marketing practices, and ensuring diversification and sustainability of local food production.

### c Evidence-based interventions and <u>risk-assessed investments</u> in health

The appraisal of specific interventions to include within a program of action (or a **portfolio** of actions) requires clearly defined criteria. Systematic reviews provide only limited forms of evidence, and these can be supplemented with the inclusion of information and evidence from a much broader range of sources ([39]).

This wider range of potential actions can be evaluated according to how 'promising' they may be in addressing diet and physical activity behaviour, using a health gain/risk framework. The criteria used to select interventions for a portfolio of actions include:

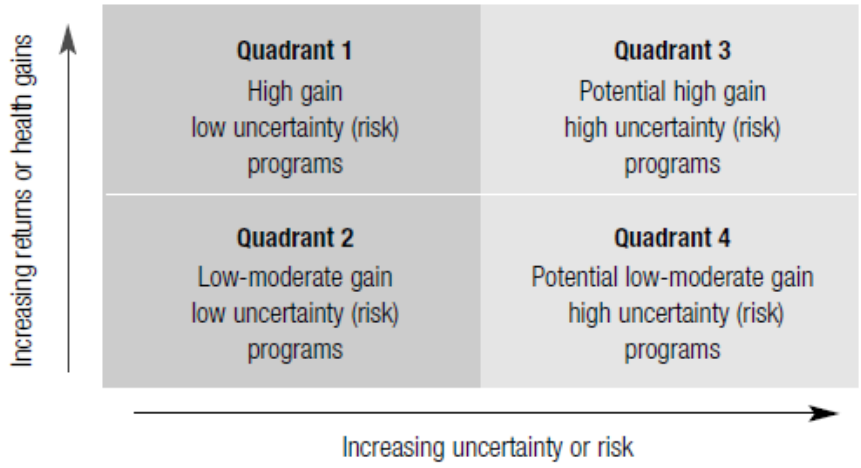
- Some evidence of a positive impact on weight status, energy balance or a behaviour underlying energy balance: including some evidence of efficacy/effectiveness, and some evidence for feasibility of implementation
- Sound theoretical base or rationale, and relevance to health policies and programmes
- The scope for potential health gain, and the avoidance of widening health inequalities
- The potential reach of the intervention across social groups and penetration within social groups

• The potential sustainability of interventions and self-perpetuation through changes in cultural norms and standards.

Some interventions will offer greater potential gains than others and this needs to be factored into selection. The classification of interventions as a product of the potential gain in health and the level of certainty of achieving a favourable outcome (likelihood of success, or **risk**) is weighed against the potential health gain, or **return** based on known or modelled efficacy, potential population reach, and likely uptake. Uncertainty or risk can be defined in terms of the level of information or evidence available to support the effectiveness of the intervention.

In this model (see Figure 14), the ideal situation is to have well-proven (low risk) interventions with large beneficial outcomes (high return) – shown in the top left quadrant of the model below. There are no known interventions for child obesity in this quadrant. Equally, it is important to avoid wasting resources in low-return, highly uncertain interventions (the bottom right quadrant), and there are many such interventions for child obesity, involving small-scale activities working with a few individuals or families, with only modest effects.

**Figure 14 Separate dimensions of 'risk' and 'return' in a health promotion portfolio**




With this model in mind as a framing for choosing actions, the next section looks at currently recommended and potentially useful interventions which may apply in the Eastern Mediterranean region.

# 5 Choosing action

The WHO report on diet and chronic disease prevention ([40]) identified several intervention points for reducing the risk of overweight and obesity, as shown below (Table 4).

**Table 4**

**Summary of strength of evidence on factors that might promote or protect against weight gain and obesity[a]**

| Evidence | Decreased risk | No relationship | Increased risk |
|---|---|---|---|
| Convincing | Regular physical activity<br>High dietary intake of NSP (dietary fibre)[b] | | Sedentary lifestyles<br>High intake of energy-dense micronutrient-poor foods[c] |
| Probable | Home and school environments that support healthy food choices for children[d]<br>Breastfeeding | | Heavy marketing of energy-dense foods[d] and fast-food outlets[d]<br>High intake of sugars-sweetened soft drinks and fruit juices<br>Adverse socioeconomic conditions[d] (in developed countries, especially for women) |
| Possible | Low glycaemic index foods | Protein content of the diet | Large portion sizes<br>High proportion of food prepared outside the home (developed countries)<br>"Rigid restraint/periodic disinhibition" eating patterns |
| Insufficient | Increased eating frequency | | Alcohol |

Source: WHO TRS 916

While this report helped to identify target areas for action, it did not specify the policy measure that would be needed in order to reduce risk. The steps towards policy-making were started with the *Global Strategy on Diet and Physical Activity* and have continued with subsequent action plans and NCD strategy documents. These have gradually refined the broad-brush statements of policy need to more specific proposals which take account of costs and the 'investment for health' approach to choosing interventions.

## a Best buys

The investment approach is reflected in the move towards describing public health interventions in a language of 'best buys'. These have been developed for the literature leading to the High Level meeting on NCDs at the UN in 2011, and summarised in Table 5.

**Table 5 Proposed best buys in tackling NCDs**

| | | | | | |
|---|---|---|---|---|---|
| **Unhealthy diet**<br>(15-30m DALYs; 1-2% global burden)[c] | **Reduce salt intake ***<br>**Replace trans fat with polyunsaturated fat ***<br>**Promote public awareness about diet *** | Effect of salt reduction: 5 m DALYs averted<br><br>Other interventions: Not yet assessed globally | Very cost-effective | Very low cost | Highly feasible |
| | Restrict marketing of food and beverages to children<br>Replace saturated fat with unsaturated fat<br>Manage food taxes and subsidies<br>Offer counselling in primary care<br>Provide health education in worksites<br>Promote healthy eating in schools | | Very cost-effective? (more studies needed) | Very low cost | Highly feasible |
| | | | Quite cost-effective | Higher cost | Feasible (primary care) |
| | | | Less cost-effective | | Highly feasible |

| | | | | | |
|---|---|---|---|---|---|
| **Physical inactivity** (> 30m DALYs; 2.1% global burden) | **Promote physical activity ( mass media) *** | Not yet assessed globally | Very cost-effective | Very low cost | Highly feasible |
| | Promote physical activity (communities) | | Not assessed globally | Not assessed globally | Intersectoral action |
| | Support active transport strategies | | Quite cost-effective | Higher cost | Feasible (primary care) |
| | Offer counselling in primary care | | | | |
| | Promote physical activity in worksites | | Less cost-effective | | Highly feasible |
| | Promote physical activity in schools | | | | |

Source: http://www.who.int/nmh/publications/who_bestbuys_to_prevent_ncds.pdf

There have been several critiques of this approach, not least that it reduces the idea of a comprehensive portfolio of interventions down to a very small number (nine for diet and six for physical activity to cover the full range of NCDs). There is also some concern about the assumptions made for the costs – for example the cost of 'promoting public awareness about diet' is considered 'very low' and the results 'very cost effective' despite the considerable costs of teacher's time in school settings, TV and media purchase for social marketing, and the low level of behaviour change usually achieved through this approach (and the unequal distribution of this change across social groups).

Experience in the field of public health suggests that the most cost-effective initiatives are likely to be population wide and use an integrated, multidisciplinary, comprehensive and sustainable approach, involving a complementary range of actions which address the individual, community, the environment and society at large. (See BOX) Experience also shows that the provision of information about healthy choices is likely to be ineffective if there is no change to the context in which health behaviour occurs: this may be particularly the case for households unable to access the means to achieve healthy behaviour – such as easily available low cost fruits and vegetables, or local, safe recreation facilities. Thus health education strategies need to be complemented with measures to support health behaviour if inequalities in health are not be widened.

BOX
Summary of lessons learnt from other public health initiatives

There are a number of findings that are relatively consistent across a range of other public initiatives that identify their utility in guiding public health initiatives to address obesity. These include:

1. Mass media campaigns are important in changing social norms and improving the knowledge and attitudes of the community, although on their own they may not impact on behaviour. Their purpose can be to help raise understanding for new policies and regulations.

2. Education is not enough to change weight-related behaviours. There is a need to deal with societal and environmental factors which support or inhibit behaviour change.

3. Strong support and advocacy from all sections of society, including the media is important for the long term success of public health initiatives aimed at behaviour change. In addition major environmental interventions need a clear justification to be successful.

4. Programs need to reach all sections of the community - not just the motivated.

5. Changes in health-related behaviours can be slow. Sustainability of health promotion programmes is crucial to allow behaviour change over time.

## b Cost effectiveness for child obesity action

A review of 21 interventions identified as having been economically evaluated, six are based in clinical settings targeting children already overweight or obese, and of the remainder, the majority are focused on school, after-school, or school-community interventions, targeting primary school age children. The list is given in Annex 1. Only one population-wide policy intervention, the reduction of TV advertising of unhealthy food to children, was included, and this has the potential to impact on all children, irrespective of age, gender or social class and has potential long-term sustainability ([41]). This intervention, along with five of the community-based, non-clinical interventions, were considered 'dominant' in that they would result in both health gains and real cost savings to health services or society. Twelve other interventions (including seven school-based interventions) were cost-effective (the costs were considered acceptable for the benefits gained) or considered likely to be so. No estimates are available to date for built environment or town planning interventions such as safety of neighbourhoods or provision of cycle lanes, even though these are likely to have wider health benefits across a community.

It should be noted that the estimates were based on the effects of reduced child obesity rates on adult diseases. They did not consider the health benefits that might arise (for example from increased physical activity or healthy eating) when there is no impact on obesity, and they generally did not include any impact on comorbidities which occur in childhood and adolescence due to the lack of reliable epidemiological evidence.

It should also be noted that the evidence base used in this review was largely derived from studies in developed economies and that the studies themselves suffer from a 'settings bias' because the most common types of intervention are in schools, where matched control groups are available, rather than in larger community settings, retails shops or fast food outlets, or interventions that affect the whole population such as taxes, subsidies or labelling regulations.

## c Population-wide child obesity prevention

According to the WHO document 'Population-based prevention strategies for childhood obesity' ([42]) experience in several countries has shown that successful behaviour change during childhood can be achieved through a combination of population-based measures, implemented both at the national level and as part of local 'settings-based' approaches, in particular, school- and community-based programmes. Population-based prevention involve shifting the responsibility of tackling health risks from the individual to governments and health ministries, thereby acknowledging the fact that social and economic factors contribute strongly to disease. \
Although local intervention allows action to be tailored to meet the specific context and nature of a problem, only national guidance (and funding) can ensure effectiveness and sustainability of action at a population level.

***Examples of population-wide measures***

Examples of areas for intervention which have a strong rationale and good evidence base are sown below, with specific examples of actions which may be included in a portfolio of recommendations for EMRO member states.

Selection of actions for a portfolio should include at least one from each area, and should be assessed for their likely impact on health inequalities and risk of unintended consequences. Actions should be chosen for their likely impact, reach and sustainability, as well as feasibility and effects on reducing health inequalities. In many of the suggested actions, the beneficiaries will include other age groups as well as children.

| **Area for intervention** | **Examples of actions** |
|---|---|
| Early life exposures and growth patterns | a) Targeted subsidies for nutritious foods for pre-pregnancy and pregnancy<br>b) Counselling in pregnancy, breast-feeding support, baby-friendly hospitals<br>c) Provision of breast feeding facilities in out-of-home environments<br>d\0 \support for breastfeeding in workplaces employing women, support for maternity leave<br>d) Subsidies to foods for mothers 0-6m and infants 6-24m, especially for disadvantaged groups<br>e) Controls on marketing formula and inappropriate complementary foods/drinks<br>f) Review feeding programmes which encourage rapid early weight gain in infants |
| Addressing community understanding and social norms | a) Develop and publicise government-endorsed food-based dietary guidelines, including for infants and children, and nutrient profiling to classify food products as promoting or undermining the guidelines.<br>b) Use guidelines to set kindergarten and nursery food standards, school food standards and hospital food standards as beacons of good practice. Support with licensing and inspection.<br>c) Work with public health agencies, non-governmental health and consumer groups to develop public campaigns on healthy child nutrition<br>d) Recruit concerned celebrity to lead publicity campaigns for child healthy growth<br>e) Use social marketing campaigns to support proposed legislation for regulating food marketing and for improving school standards and planning regulations<br>f) Review TV soaps for messages about infant feeding and child weight (and height, and PA), and ensure consistency with guidelines<br>g) Provide fresh drinking water outlets wherever children (and others) gather: in schools, play areas, parks, leisure facilities, primary care centres (and hospitals, workplaces). |
| Exposure to marketing of | a) Develop government-led criteria for restricting children's exposure and a timetable for implementation (NB WHO Guidance Document) |

| | |
|---|---|
| foods and lifestyles | b) Monitor implementation (commercial data sources and independent/NGO surveys)<br>c) Negotiate regional standards to apply to media crossing borders<br>d) Impose taxes (or removing tax exemptions) on advertising for HFSS food and beverages<br>e) Remove incentives to unhealthy diets, such as vending machines in schools and access to near-school fast food caterers<br>f) Remove incentives to unhealthy impulse purchases (snacks, confectionery) at shop checkouts<br>g) Improve consumer information with interpretative front-of-pack nutrition signalling |
| Influencing the food supply chain and the food market | a) Use government and local authority purchasing contracts to influence standards and prices (e.g. supporting fresh, perishable products)<br>b) Use fiscal measures (e.g. sales taxes, e.g. distribution subsidies) to influence price and availability<br>c) Support food chains for perishable foods to maintain low prices, e.g. subsidies for cold-chain equipment<br>d) Support small shops selling perishable foods in disadvantaged communities e.g. freezer units for frozen fish, vegetables<br>e) Promote food hygiene in catering through use of steam/boil rather than deep-fry |
| Improved physical activity and nutrition in everyday life | a) Set national school and kindergarten standards for a minimum expected level of physical activity provision, and a maximum level of sedentary behaviour, especially TV and screen watching.<br>b) Ensure schools offer a range of activity options, including options suitable for non-sport participants such as dance, self-defence, weight-training.<br>c) Encourage schools to offer their activity facilities to NGOs and clubs etc for children to use during out-of-school hours.<br>d) Ensure no financial barriers to the use of leisure activity facilities in communities – e.g. children-pay-nothing swimming pool sessions.<br>e) Ensure planning regulations set a minimum provision of free-access play space for children, especially in urban high-density residential areas.<br>f) Ensure planning regulations limit the availability of fast food outlets near to schools<br>g) Ensure planning regulations encourage new suburbs to include safe walking and safe cycling routes, and access to shops and services without dependence on cars or requiring unsafe crossing of car routes. |

# 6 Next steps

The present document identifies the need for stronger action to tackle child obesity, and having provided the background and the farming of the problem, we need here to consider what steps are needed next.

The tasks to be undertaken fall into four areas: (i) enhanced surveillance, including surveillance of the 'causes of the causes', (ii) the development of tools to assist in policy-making, (iii) the agreement of a set of key investments in child health through the life course, and (iv) the need for strengthening support for leadership to make progress on these issues, which is especially important if efforts for health promotion are confronted by potentially conflicting interests of economic growth and commercial market development.

## a Surveillance needs

The United Nations High-Level Meeting on non-communicable diseases recognised the enormous global burden posed by poor diet and physical inactivity, and called for urgent preventative action with increased monitoring of NCDs and their risk factors to improve population health. In 2013 the World Health Assembly adopted a *Draft comprehensive global monitoring framework and targets for the prevention and control of NCDs* with indicators for health outcomes, risk factors (including obesity and hypertension) and national system responses. Childhood obesity was reflected in one target (no further increase in obesity prevalence levels among adolescents). In addition, two indicators of food environments are included in the framework: reduced food marketing to children and reduced saturated and trans-fats in the food supply.

Such monitoring only touches lightly on the need for better information on the unfolding environment for children in the 21st century. Not only should there be a continuing programme of child health surveillance which includes growth monitoring at regular stages throughout childhood, here also needs to be regular monitoring of the key environmental influences on health behaviour, especially the food environment and the environment for physical activity and sedentary behaviour.

As suggested earlier, in the framing concepts of nutrition security and physical activity security, it is important to ensure the availability *and consumption* of healthful foods and the *use* of activity-enhancing resources, and to tackle counter-active inducements to consume unhealthy diets and to be inactive for long periods. A programme for monitoring food environments is being developed by a global NGO-academic network ([43]) (see BOX) and a similar network for physical activity could be conceived.

**BOX**
**INFORMAS** (International Network for Food and Obesity/NCDs Research, Monitoring and Action Support), a global network of researchers and NGOs which aims to monitor and benchmark policies and actions to create healthy food environments.

**Promoting health through improved food environments:** Food environments are important determinants of dietary choices, but to date no countries are comprehensively monitoring those. Additional modules (food production, food waste) and indicators (sustainability and equity) will follow later in the project.

| Module | Examples of information sources | Examples of indicators |
|---|---|---|
| ***Food environments*** | | |
| Composition | Comparison sites, crowd sourcing of label data | Nutrient profiles, levels of salt, sugar and fat in key foods |
| Labelling | Retailers' websites, crowd sourcing, image search engines | Proportion of foods with health and nutritional claims that are healthy |
| Promotion | Spot-surveys, social media probes, purchased data, site hits, Facebook friends, Tweets. | Usage, impacts, exposure of children to unhealthy food advertisements. |
| Provision | Crowd sourcing, suppliers' databases | Food quality, adherence to standards; availability, affordability. |
| Prices | Comparison sites, household budget surveys, commercial databases. | 'Healthy' *vs* 'current' diets; affordability by socio-economic status (SES), price trends. |
| Retail | GPS data; food outlet lists, Google Street, in-store sampling | Outlet density; shelf space; checkout displays. |
| Trade, investment | Trade data, cross-border agreements, stockbroker advisories. | Trade trends, inward investment, domestic protection. |
| ***Food policies and actions*** | | |
| Public sector | Policy text analysis, key interviews, departmental budgets. | Infrastructure (leadership, governance, funding), impact (standards, regulations, health assessments). |
| Private sector | Text analysis, key interviews, consumer and market surveys, investor forecasts. | Access to nutrition index (ATNI); plus indicators of industry influence on policies. |

Source: INFORMAS, a global network for monitoring food environments. See http://onlinelibrary.wiley.com/doi/10.1111/obr.2013.14.issue-s1/issuetoc 2013.

### *Surveillance needs – NEXT STEPS*

(i) Draft a set of indicators to recommend to Member States, including 'core', 'extended' and 'optimum' sets of indicators to allow a step-wise approach. These should include information on food and activity environments, data on markets and market trends and promotional marketing activities.

(ii) Consider a regional coordination office (or observatory), to encourage consistency in data collection, provide advice, training and technical support, produce cross-regional reports, and identify multi-country opportunities for support.

## b Tools for policy development

Several tools have proved useful when developing stronger policies for nutrition and physical activity. Among them are

### *(i) National [regional] food based dietary guidelines*

Government-approved guidelines underpin health promotion policies which seek to change from current consumption patterns towards healthier consumption patterns. They provide a basis for benchmarking progress towards healthier behaviour. They are a valuable tool when arguing for consistent health messages, especially when attempting to control marketing messages such as health claims on products and supplements. They form the basis for the development of nutrient profiling schemes.

### *(ii) National [regional] nutrient profiling scheme(s)*

The definition of which foods should be promoted and which foods should not be promoted may need to be put on a legal or statutory basis, and for this it is valuable to develop a nutrient profiling schemes suitable for this purpose. Nutrient profiling schemes define food groups and products into categories which indicate their healthfulness, and this can serve a range of purposes: limiting advertising of high-risk foods to children, providing indicators of nutritional value on food labels (e.g. traffic light signals), controlling which foods are able to carry health and nutrition claims, identifying company product portfolios for rating companies as suitable for government purchasing contracts and government research and development support, and a range of other uses ([44]).

### *(iii) Evidence library or database to provide support for policy-makers*

Whilst the implementation of policies may require different strategies if different member states, the rationale for introducing a policy is likely to be the same across all of them, and the underpinning evidence to support a policy proposal can be developed collectively. The WHO HQ database eLENA (e-Library of Evidence for Nutrition Actions) is being built but includes few population-level actions targeting obesity (one for soft drinks is under development). GINA (Global database on the Implementation of Nutrition Action) is also under development and will help identify examples of projects and programmes already implemented in one or more member state. A regional extension of these approaches, perhaps focusing on food and physical activity environments and linked to a surveillance observatory (see above) might be valuable

### *Tools – NEXT STEPS*

Identify the staff member best able to collaborate with WHO HQ on the development of these tools, and who can also draw on the experiences of other WHO regions.

## c Priorities for an investment portfolio, and institutional support for implementation

In section 5 above we considered the best buys, the need for a portfolio of different types of intervention to allow for higher-risk, higher-return as well as lower-risk (but usually lower return) options to be explored. A list of population-wide actions was described. These were based on reports from different regions around the globe, and drawing on studies which were localised and contextually bound to local cultures, markets, and policy-making/political environments. Put briefly, the 'best buys' and other potential 'good buys' need to be reviewed and placed in a regional context, and checked for their potential unintended consequences, e.g. in respect of under-nutrition and growth, and effects on health inequalities.

In order to make the list of best and good buys relevant and applicable to the member states in Eastern Mediterranean region, a process of consultation within and between member state governments needs to be undertaken. As with many consultations, the activity will serve two purposes (i) to reach a consensus on what the realistic and well-supported actions should be / identify the unrealistic and poorly-supported actions, and (ii) help to raise awareness and develop the analytical thinking of the participants in the consultation.

***Portfolio development and support – NEXT STEPS***

Identify the staff member best able to

- Edit the portfolio into a set of actions for discussion;
- Circulate these to focal points and other government contact points with encouragement to provide responses;
- Convene a meeting of relevant officials with cross-governmental experience who can make recommendations for prioritising and operationalising the proposed actions;
- Prepare a set of recommended actions (possibly not identical for all member states).

In addition, funds should be raised to support:

(i) A regional Child Growth Advisory Network of governmental, health professionals, researchers and advocacy NGOs to refine the regional strategies [NB commercial partners may be consulted but do not participate in making Network recommendations];

(ii) An 'Obesity Observatory' to review evidence and trends and to monitor policy development and implementation, and able to support the work of the Network. Raise funds for WHO to develop region-wide capacity for promoting food and physical activity programmes [and to host the Obesity Observatory].

## d Leadership, governance, and conflicting interests

Ministers of Health often need support in getting their policies introduced in cabinet and in some countries any proposed health legislation has to demonstrate the business/economic impact it may have. (It is rare that the reverse is required, in which business proposals have to show their health impacts, despite frequent calls for 'health in all policies' and the work on developing health impact assessment tools.) Ministers need support, and for this a number of possibilities are open:

(i) demonstrate a strong business case. This requires showing that the health gains have economic benefits, in terms of reduced health care costs, social care costs, and business productivity losses. These benefits may have to be seen to overcome the costs of reduced markets, through e.g. lower sales of soft drinks, and the consequent lost of employment and lower GDP.

(ii) demonstrate their obligations to follow international charters (e.g. for child rights) and agreements (e.g. for tobacco) and recommendations from authorities such as WHO.

(iii) demonstrate popular support by showing calls from non-governmental organisations, including health and consumer advocacy groups but also pro-family and child interest groups (churches, charities etc) and spontaneous campaigns by parents/mothers networks.

(iv) counter the potential resistance from commercial interests by opening up and making more transparent the lobbying activities, party-political donations, and parliament members' interests which support private sector influence on policies.

(v) introduce public health acts or similar measures in order to enable ministers to use their statutory powers to intervene for the protection of citizens from potential public health hazards, including those linked to chronic disease.

(vi) use government purchasing powers to influence markets by ensuring that all health (and school) institutional food supplies meet standards for highest health attainment. Not only does this boost the market for healthier products but also sets a public example of government-endorsed standards for what should be given to children – a beacon of best practice.

***Governance - NEXT STEPS***

For WHO, support for ministers can be provided by

(i) assisting with technical support to develop the economic case for action;

(ii) issue strong recommendations for practice, with accompanying guidance on implementation;

(iii) encourage member states to develop their civil society sector, to serve as a means of expressing public demands and countering commercial interests;

(iv) develop case studies of public health acts and other legal measures which have been used for intervening in markets – e.g. for alcohol, tobacco, infant formula;

(v) prepare to set up inter-governmental meetings to coordinate strategies for cross-border actions, such as the regulation of advertising to children in the region.

## Annex 1: Cost-effectiveness of childhood obesity prevention interventions

Note that these estimates consider effectiveness in terms of obesity reduction or change in BMI and not other potential health benefits.

| Intervention | Country | Setting | Target population | Time horizon | Measure of health gain | Reference |
|---|---|---|---|---|---|---|
| **Dominant: net cost savings with health gains** | | | | | | |
| Reduction of advertising of 'junk food' | Australia | Media | Children 0-14 years | 1 yr intervention, life-time modelling | Dominant (health gains and cost offsets: BMI and DALYs saved) | Magnus et al 2009[56] |
| Education program to reduce sugar sweetened drink consumption | Australia | School | Primary school children 7-11 yrs | 1 yr intervention, life-time modelling | Dominant | Vic Dept of Human Services ([45]) |
| Multi-faceted targeted program | Australia | School | Overweight and obese primary school children 7-10 yrs | 1 yr intervention, life-time modelling | Dominant | Vic Dept of Human Services |
| Multi-faceted program including nutrition and physical activity | Australia | School | Primary school children 6 yrs | 1 yr intervention, life-time modelling | Dominant | Vic Dept of Human Services |
| Education program to reduce TV viewing | Australia | School | Primary school children 8-10 yrs | 1 yr intervention, life-time modelling | Dominant | Vic Dept of Human Services |
| Family-based targeted program | Australia | Clinical | Obese children 10-11 yrs | 1 yr intervention, life-time modelling | Dominant | Vic Dept of Human Services |
| **Likely to be cost-effective** | | | | | | |
| Medical College of Georgia FitKid project | USA | School (after hours) | 3rd grade students | 1 yr | USD317 per 0.76% reduction in body fat | Wang et al 2008 ([46]) |
| Be Active Eat Well multi-faceted community based program | Aust | School | Primary school children 5-12 yrs | 3 yr intervention, life time modelling | Net cost per DALY saved AUD29,798 (dominated;AUD0.26M) | Moodie et al 2013 |
| APPLE multi-faceted school-based program | New Zealand | School | Primary school children 5-12 yrs | 4 yrs | NZD664-1708 per kg of weight gain prevented | McAuley et al 2010 [47] |
| Multi-faceted program excluding nutrition and physical activity | Australia | School | Primary school children 6 yrs | 1 yr intervention, life-time modelling | AUD21,300 per DALY saved | Vic Dept of Human Services |
| Cuenca Study- school-based physical activity program | Spain | School | Primary school children 9-10 yr old | 8 months | €500 saved per 1% decrease in triceps skinfold thickness | Martinez et al. 2011 ([48]) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Coordinated Approach to Child Health (CATCH) | USA | School | Children 8-11 yrs | 3 yr intervention, modelling up to age 64 yrs | USD900 per QALY saved | Brown et al 2007 ([49]) |
| Planet Health | USA | School | Children 11-14 yrs | 2 school year intervention, modelled to age 65 yrs | USD4035 per QALY saved | Wang et al 2003 ([50]) |
| Family-based group treatment | Finland | Clinical | Obese children 7-9 yrs | 6 mths | €53 per 1% decrease in weight for height | Kalavainen et al 2009([51]) |
| Laparoscopic adjustable gastric banding | Australia | Clinical | Severely obese adolescents 14-19 yrs | 1 yr intervention, life-time modelling | AUD4,400 per DALY saved | Ananthapavan et al 2010([52]) |
| Family-based GP mediated program | Australia | Clinical | Overweight or moderately obese children 10-11 yrs | 1 yr intervention, life-time modelling | AUD4,700 per DALY saved | Moodie et al. 2008 ([53]) |
| RCT-evaluated lifestyle interventions to treat overweight and obesity | United Kingdom | Clinical | Obese children 10-11 yrs | 1 yr intervention, life-time modelling | £13,589 per life year gained | Hollingworth et al. 2012 ([54]) |
| Family-based group treatment | Canada | Clinical | Obese children 8-12 yrs | 20 weeks | Group treatment gave 14% reduction in overweight prevalence per $1000 spent. | Goldfield et al 2001 ([55]) |
| **Unlikely to be cost-effective** | | | | | | |
| Active After School Communities Program | Australia | School (after hours) | Primary school children 5-11 yrs | 1 yr intervention, life-time modelling | AUD82,000 per DALY saved | Moodie et al 2009 ([56]) |
| TravelSMART Schools | Australia | Neighbourhood | Primary school children 10-11 yrs | 1 yr intervention, life-time modelling | AUD117,000 per DALY saved | Moodie et al 2011 ([57]) |
| Walking School Bus | Australia | Neighbourhood | Primary school children 5-7 yrs | 1 yr intervention, life-time modelling | AUD760,000 per DALY saved | Moodie et al 2009 ([58]) |

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