Invited paper

Regional overview of maternal and child malnutrition: trends, interventions and outcomes
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SUMMARY The proportions of underweight, wasted, and stunted children, as well as the infant and under-5 mortality rates, have all exhibited downward trends in the Region over the past 2 decades. This is in part attributable to maternal and child nutrition intervention programmes, especially those in which women were actively involved. Programmes which support and promote breastfeeding, such as the Baby Friendly Hospital Initiative, have also contributed to this trend, although the number of baby friendly hospitals varies considerably between countries. Available information also shows that anemia is quite common among women, many of whom also have a low weight and stature and seem to suffer from osteoporosis. In several countries of the Region a number of micronutrient deficiency control programmes are in progress, such as iron supplementation for pregnant women, fortification of flour and iodization of salt. Iodine deficiency disorders are under control in 2 countries of the Region and legislation for salt iodization is in place in 17 countries. Prevalence of severe malnutrition in children is much lower than that of milder levels, thus, promotion of the nutrition status of mildly to moderately malnourished children could lead to a sizeable reduction in child mortality.

Introduction

The Eastern Mediterranean Region of the World Health Organization comprises 22 countries extending from Pakistan in southern Asia to Morocco in North Africa. These countries are ecologically, economically, and socially very different and at various stages of development. Per capita GNP ranges from US$ 130 to US$ 18,270. They also vary considerably with regard to the health and nutrition situation and achievements in combating malnutrition and promoting health and nutrition of the people. Many of them can be said to be food-secure on an average basis [1], although significant intra-population differences exist. In this review, an overview of the nutrition status of mothers, children under 5 years old, trends and relevant intervention projects and programmes is presented.

Malnutrition

Trends

Growth faltering and malnutrition usually start at around the age of 6 months, mainly because complementary feeding is either begun late or is not done properly. Table 1 shows the trend of child malnutrition and mortality in the Region in the past 1–2 decades.

The proportions of underweight, wasted and stunted children, as well as the infant and under-5 mortality rates have all exhibited downward trends in the Region.
as a whole, although considerable inter-
country variation exists. According to de 
Onis, Frongillo and Blössner, stunting rates 
in the Region ranged between 7.8% (Jor-
dan) and 36.3% (Pakistan) in the mid-
to late 1990s \[2\]. The downward trends can 
at least partly be attributed to implemen-
tation of programmes such as breastfeed-
ing promotion, mother and child nutritional 
terventions, community-based projects and 
better health service coverage (some of 
these programmes will be discussed brief-
ly).

With regard to low birth weight, the pic-
ture is different; the prevalence of low birth 
weight increased from around 10% in 1990 
[3] to around 11% in 1997 [4], stayed con-
stant until 2000, and increased again to 
around 14% at the turn of the century [5]. 
Since birth weight is an indication of the 
mother’s nutrition during pregnancy, an 
upward trend for the prevalence of low 
birth weight in a community would indi-
cate, at least indirectly, a worsening of 
women’s nutrition and feeding behaviour 
during pregnancy.

Anaemia, mainly due to iron deficiency, 
is a widespread nutrition and public health 
problem in all countries of the Region, irre-
spective of family economic status and in-
come level. The prevalence of moderate 
plus severe forms among women and 
young children is 25%–60% [6]. Accord-
ing to Aoyama, the overall prevalence 
among women ranges between 6% (Libyan 
Arab Jamahiriya) and 17%–79% (Egypt) 
[1]. The major causes and contributing 
 factors are low dietary iron bioavailability, 
intestinal parasite infestation and short birth 
s pacing. In addition, general observations 
and limited data indicate that sizeable pro-
portions of women also suffer from os-
teoporosis and have a low body weight and 
small stature.

Although mild and moderate forms do 
exist, clinical vitamin A deficiency does not 
appear to be a major problem in the Region 
as a whole owing to high consumption of 
green leafy vegetables, a rich source of 
pro-vitamin A (β-carotene). Deficiencies of 
folic acid, zinc, and vitamin D have also 
been observed [7], however, not much de-
tailed information is available on them.

**Nutrition transition**

Nutrition transition is occurring in many 
counties of the Region. In addition to un-
dernutrition, overnutrition (chronic nutri-

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mortality rate per 1000 live births</th>
<th>Moderate &amp; severe malnutrition in children under 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infants &lt; 5 years</td>
<td>Underweight</td>
</tr>
<tr>
<td>Initial</td>
<td>57</td>
<td>17</td>
</tr>
<tr>
<td>Final</td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td>Change (%)</td>
<td>–19.3</td>
<td>–17.6</td>
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<tr>
<td>Trend</td>
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tional conditions and diseases such as over-
weight, obesity, cardiovascular disease, di-
abetes, hypertension and cancer) is
widespread as a result of socioeconomic
and lifestyle changes such as low level of
physical activity, imbalanced diet, stress,
etc. Obesity, a disease in itself and a risk
factor for several other chronic diseases,
affecting up to 40% of the population as a
whole, seems to be more prevalent among
women than men. In many countries for
which data are available, overweight and
obesity (based on weight for height) are
also prevalent among children and adoles-
cents and are on the increase. According to
de Onis and Blössner, the proportion of
overweight, based on the National Center
for Health Statistics standards, in children
under 5 in 12 of the countries of the Region
ranged between 0.9% (Oman) and 8.6%
(Egypt) in the mid- to late 1990s [8].

**Intervention projects and
programmes**

Not much published information is avail-
able on the maternal and child nutrition in-
tervention projects and programmes in the
Region. Allen and Gillespie, in an excellent
publication, reviewed thoroughly and criti-
cally the nutrition intervention programmes
conducted in many countries, including
some of the countries of the Eastern Medi-
terranean Region [9]. They showed that,
for example in Pakistan, those pilot projects
aiming at improvement of maternal and
child nutrition in which women were ac-
tively involved had greater chances of suc-
cess. In these projects, both macro-level
(poverty alleviation, food fortification,
etc.) and micro-level (nutrition and nutri-
tion-related services, professional training,
etc.) approaches were used, and the public
sector, the community as a whole, nongov-
ernmental organizations, hospitals, univer-

sities and international organizations were
involved. Some of the pilot projects have
been reasonably successful. Large-scale
projects at the national level should now be
designed, implemented and evaluated.

On the other hand, in Oman, despite
striking success in child survival and de-
velopment, a community-based nutrition in-
tervention project using the Triple-A
approach (assessment, analysis, action)
could not bring about an equally striking
improvement in the nutrition status of chil-
dren under 5 years old [10], although it did
considerably reduce the number of under-

Another example is from the Islamic
Republic of Iran. Following a successful
community-based project in Sibak village
[12], another project using the Triple A ap-
proach was conducted in 3 geographically,
ecologically and socioeconomically differ-
ent rural regions in 3 provinces between
1996–1999, aiming at reducing malnutri-
tion in 6–35-month-old children [13]. Nu-
tritional and non-nutritional strategies
included growth monitoring, demonstra-
tion of complementary food preparation,
home gardening, and income-generation.
By the end of the period prevalence of un-
derweight had decreased from 21%–38%
to 10%–15% ($P < 0.0001$) and stunting
prevalence had decreased from 25%–41%
to 12%–15% ($P < 0.0001$). Further analy-
sis of the data showed the main factors in
the success of the project to be political
commitment at the highest level in the re-
spective provinces, applied health and nu-
trition education, intersectoral collabora-
tion and community involvement. The
project is now being expanded to other
provinces.

Finally, assessment of maternal and
child nutrition status in a health care pro-
gramme in Saudi Arabia showed the nutrition
status of the mothers and 0–2-year-old
children to be relatively satisfactory, 90% of the children having a normal weight and height [14]. No initial assessment, i.e. at the start of the programme, had, however, been made, therefore no final conclusion could be drawn about its effectiveness and impact.

The Baby Friendly Hospital Initiative, launched jointly by the United Nations Children’s Fund and the World Health Organization in 1991–92, with the aim of supporting and promoting breastfeeding in different countries, has been successful in its goals and objectives in the Region [15]. The national breastfeeding authorities control the relevant measures and programmes using global criteria. As a result of these efforts, more mothers now breastfeed their infants in the Region as a whole. The proportion of children exclusively breastfed for 3 months is over 40%. The proportion breastfed for 6–9 months with complementary feeding increased from 38% in the period 1990–1996 to 45% in the period 1995–2002, and about one third are now breastfed for 20–23 months.

Two points are worth mentioning here. First, the number of baby friendly hospitals varies considerably in the countries of the Region. While a few countries still have none, the number generally ranges between 1 (Afghanistan) and 376 (Islamic Republic of Iran). Second, the breastfeeding duration and rate are actually declining in some countries of the Region, particularly in the rural areas, e.g. in Kuwait [16] and Libyan Arab Jamahiriya [17]. Serious efforts will be needed to reverse the trend.

Micronutrient deficiency control programmes

Anaemia control projects and programmes, e.g. iron supplementation and fortification, have been and are being conducted in several countries of the Region. These are in many cases components of other programmes such as primary health care. For example, iron supplements are distributed routinely to pregnant women. In several countries iron and vitamin drops are also given to infants.

Currently, Egypt, the Islamic Republic of Iran and Saudi Arabia have started fortifying wheat flour with iron (30 ppm) [18]. Other countries are in the process of planning this strategy; some are also considering the feasibility of fortifying oil or flour with vitamin A and flour with folic acid [18]. It is probably too early to judge the efficacy and efficiency of this. Anaemia is a true “multi-dimensional” phenomenon; to control it several strategies other than increasing iron intake are absolutely essential, including public health education, promotion of breastfeeding, promotion of sound dietary practices, birth-spacing, improved environmental health and sanitation.

Another problem is that the major source of iron is foods of plant origin, whose iron bioavailability is very low.

With regard to vitamin A, some small-scale projects have been conducted in the Region to control deficiency. Although, as already mentioned, clinical vitamin A deficiency is not widespread, it would be justifiable to have programmes aiming at increasing the average intake of this vitamin by women and children since it strengthens the immune system and thus helps prevent and control infections, which are a public health problem in the Region. In 2000, about 70% of the children 6–59 months old were in vitamin A supplementation programmes [19].

Control programmes for iodine deficiency disorders (IDD) are not usually targeted to specific age or sex groups, e.g. women or children, but rather to whole populations. Successful IDD control pro-
grammes would result in the promotion of iodine status in, along with other groups, women, adolescent girls and children. Consequently, improvements in their physical and mental health will occur. The Region has been very active in this area over the past 2 decades, with support from the World Health Organization, the United Nations Children’s Fund and the International Council for the Control of Iodine Deficiency Disorders [20]. Not all countries in the Region, however, have national control programmes. In 2 countries, the Islamic Republic of Iran and Tunisia, IDD has been officially declared by the World Health Organization to be under control [19], and in Jordan, Lebanon, the Syrian Arab Republic and Yemen it is said to be almost under control. Seventeen of the remaining countries have ongoing programmes for universal salt iodization and 16 have appropriate legislation for this. In the Region as a whole, about 51% of households currently consume iodized salt [5].

**General comments and recommendations**

In developing countries in general, 50% of child deaths are associated with malnutrition [21]. On the other hand, the prevalence of severe malnutrition is usually much lower than that of mild and moderate forms; for example, only 4% (less than one-third) of the final underweight cases (total = 14%) shown in Table 1 are severely underweight and the other 10% are moderately so. Therefore, in addition to combating severe protein–energy malnutrition, promotion of the nutrition status of mildly to moderately malnourished children is also quite justifiable since it will lead to a reduction in child mortality.

In many cases, child malnutrition is related more to poor child care practices and infections, e.g. intestinal parasites, than to a low food intake as such [22]. This should be borne in mind when designing intervention programmes.

Special attention should be paid to the following when designing strategies and policies: intersectoral and intrasectoral collaboration, nutrition surveillance, monitoring and evaluation, inter-country collaboration, political commitment, technical and technological capacity and development of competence, community involvement, and proper legislation (e.g. for food fortification). In many areas, applied research is essential so that more effective intervention programmes can be designed and implemented.

**References**


