

# NUTRITION

## for Health and Development

*A global agenda for  
combating malnutrition*



**World Health Organization**  
**Nutrition for Health and Development (NHD)**  
Sustainable Development and Healthy Environments (SDE)

**PROGRESS  
REPORT**

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# VISION

## Nutrition for Health and Development

### **A global strategy for combating malnutrition**

■ **Our vision** is of a world where people everywhere, at every age, enjoy a high level of nutritional well-being, free from all forms of hunger and malnutrition.

■ **It is founded** on the intrinsic value of human life and the dignity it commands, as reflected in the international human-rights instruments adopted over the last half century. Everyone, without distinction of age, sex, or race, has the right to nutritionally adequate and safe food and to be free from hunger and malnutrition.

■ **It rests** on the conviction that hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this widespread, continuing human catastrophe. It recognizes that hunger and malnutrition are rooted in poverty, deprivation, and underdevelopment, and that they are the result of inadequate access to the basic requirements for nutritional well-being, including safe and adequate food, care, health, education and a clean environment.

■ **WHO**, with its health sector focus, has a major responsibility for promoting healthy nutrition for all the world's people, through collaborative support to Member States, particularly in their national nutrition programmes, in partnership with other intergovernmental and nongovernmental organizations, and their related sectoral approaches.



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# Abbreviations

ACC/SCN	United Nations Administrative Committee on Coordination/Sub-Committee on Nutrition
AFR	WHO African Region
AGFUND	Arab Gulf Fund for United Nations Development
AMR	WHO Region of the Americas
APO	Associate professional officer
APW	Agreement for performance of work
ARI	Acute respiratory infections
BFHI	Baby-friendly Hospital Initiative
BMI	Body mass index
CIDA	Canadian International Development Authority
EMR	WHO Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
EUR	WHO European Region
FAD	Food Aid for Development
FAO	Food and Agriculture Organization of the United Nations
HIV	Human immunodeficiency virus
IARC	International Agency for Research on Cancer
IAEA	International Atomic Energy Agency
IBFAN	International Baby Food Action Network
ICCIDD	International Council for Control of Iodine Deficiency Disorders
ICN	International Conference on Nutrition (Rome, 1992)
IDA	Iron deficiency and anaemia
IDD	Iodine deficiency disorders
IDECCG	International Dietary Energy Consultative Group
IDRC	International Development Research Centre, Ottawa
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute, Washington, DC
ILO	International Labour Organization
ILSI	International Life Sciences Institute
IRH	Institute of Reproductive Health, Georgetown University, Washington, DC
IMCI	Integrated management of childhood illness

## NUTRITION FOR HEALTH AND DEVELOPMENT: PROGRESS REPORT

INACG	International Nutritional Anaemia Consultative Group
IUGR	Intrauterine growth retardation
IUNS	International Union of Nutritional Sciences
IVACG	International Vitamin A Consultative Group
MDIS	Micronutrient Deficiency Information System (WHO)
MI	Micronutrient Initiative, Ottawa
NCD	Noncommunicable disease
NCHS	National Center for Health Statistics, Washington, DC
NGO	Nongovernmental organization
NHD	WHO Department of Nutrition for Health and Development
ORSTOM	Institut français de recherche scientifique pour le développement en coopération
PAMM	Programme Against Micronutrient Malnutrition
PEM	Protein-energy malnutrition
SD	Standard deviation
STC	Short-term consultant
STP	Short-term professional
TGR	Total goitre rate
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNU	United Nations University
VAD	Vitamin A deficiency
WHO/PAHO	World Health Organization/Pan American Health Organization
WFP	World Food Programme
WTO	World Trade Organization



## **SECTION 1**

# **NUTRITION**

The cornerstone of health  
and sustainable development

**1.1** The foundation of nutritional well-being

**1.2** Food and nutrition: a human-rights perspective



## 1.1 The foundation of nutritional well-being

Nutrition is a fundamental pillar of human life, health and development across the entire life span. From the earliest stages of fetal development, at birth, through infancy, childhood, adolescence, and on into adulthood and old age, proper food and good nutrition are essential for survival, physical growth, mental development, performance and productivity, health and well-being. It is an essential foundation of human and national development.

The fundamental WHO goal of Health for All means that people everywhere, throughout their lives, have the opportunity to reach and maintain the highest attainable level of health. This is impossible in the presence of hunger, starvation, and malnutrition.

Human nutrition is a scientific discipline, concerned with the access and utilization of food and nutrients for life, health, growth, development, and well-being. The scope of human nutrition is vast, ranging from biological and metabolic nutrition, through whole-body and clinical nutrition, to the massive public health nutrition issues of national nutrition programmes and the global prevention, control, and elimination of malnutrition and nutritional disorders.

Given nutrition's foundational importance for health and development, WHO has consistently regarded nutrition as central to its mandate since the Organization was established in 1948. WHO focuses on priority issues at all these levels, namely in basic nutritional science, in nutritional care throughout the life span from infancy to old age, and most importantly, in nutrition policies and programmes for sustainable development.

**Nutritional well-being** depends upon four main factors: food, care, health, and environment.



### Food and nutrient security

**Food and nutrient security** means access by all people of all ages, in all seasons, to the food, diet and nutrients they need for a healthy life. From WHO's health-focused perspective, this means action to ensure, for example, that :

### WHO'S focus on nutrition: some examples

#### Biological/metabolic level

- Amino acid metabolism (for determining new protein requirements for infants)
- Calcium, vitamin D, and peak bone mass
- Carbohydrate metabolism (for setting carbohydrate requirements in humans)
- Dietary and nutritional mechanisms in heart disease and cancer
- Energy metabolism and obesity
- Essential fatty acids, saturated fatty acids—metabolism and requirements
- Folate absorption and metabolism
- Nutritional requirements in humans—biochemical mechanisms
- Trace element requirements in humans—biochemical mechanisms

#### Individual level: Nutritional care across the life span

- Breastfeeding and complementary feeding—care and training
- Care and management of infant feeding in the HIV affected
- Case management of obesity
- Clinical management of iron deficiency and anaemia
- Clinical management of severe protein-energy malnutrition
- Clinical management of vitamin A deficiency
- Maternal nutrition and its management
- Nutrition, diet, and hypertension in individuals
- Nutrition management of older persons

#### Community/national/global levels: Nutrition for health and sustainable development

- Development of international growth standards
- Development of national food-based dietary guidelines
- Development of national nutrition policies/plans/programmes
- Establishment of human nutritional requirements/recommended intakes
- Incorporating nutrition goals in national development programmes
- Management of nutrition in emergencies
- National anaemia prevention programmes
- National vitamin A deficiency programmes
- Nutrition and cancer prevention programmes
- Nutrition in primary health care
- Nutrition surveillance and data banking (national, global)
- Universal salt iodization and monitoring population iodine status

- pregnant women have the additional food they need to meet their nutritional requirements during pregnancy;
- the iodine requirements of the growing fetus are met;
- infants are breastfed exclusively for the first 4–6 months of life, and continue to breastfeed after complementary feeding has begun;
- infants and young children consume a safe, balanced diet to ensure optimal growth and development;
- iodine requirements of the entire population are met through iodized salt;
- vitamin A requirements are met through a balanced diet, fortified foods, and supplementation if necessary;
- iron requirements are met through balanced diet, fortified foods and supplementation if necessary;
- folate requirements, of adolescent girls and pregnant women in particular, are met; and
- households have access to sufficient amounts of safe food throughout the year to meet the nutrient requirements of all members.

### Caring for the vulnerable

**Caring for the nutritionally vulnerable** includes the time, attention, and behaviour needed (in addition to household food security requirements) to ensure healthy nutrition. Caring behaviours include proper breastfeeding and complementary feeding for infants and young children; support for mothers during pregnancy and lactation; the time and support needed to meet the nutritional needs of older persons; and improving education, literacy, social security, employment opportunities, and the rights of women. This last factor, promotion of the rights of women, has a particularly strong correlation with nutritional well-being.

### Health for all

**Good health** is as essential to nutritional well-being, as good nutrition is crucial for maintaining healthy growth and development. Preventing infection and managing infectious diseases—minimizing their incidence, duration and severity—are essential for optimizing nutrition. Access by all to adequate health care services is needed to ensure priority interventions. These include immunization, early diagnosis and management of infectious diseases—especially, diarrhoea, respiratory disease, measles, malaria, and tuberculosis—health and nutrition education, and growth monitoring.

### A safe environment

**Physical and biological environments** have a major impact on health, and sustainable policies are required to address the major environmental conditions affecting food and nutrition. Population pressures in developing countries, combined with the daily subsistence struggle of the poor, are taking a tremendous toll on the natural resources on which survival depends.

**Environmental degradation** profoundly affects nutrition. Every year, for example, some 5 to 7 million hectares of agricultural land are lost. In arid and semi-arid regions, desertification threatens 27 million hectares of irrigated land, 170 million hectares of rain-fed cropland, and 3000 million hectares of range-land.

**Deforestation** contributes to an energy crisis that has a direct bearing on nutrition and family caring capacity. Pollution and contamination of soil and water are increasingly undermining food production and safety in many parts of the world. In developing countries, microbial contaminants cause 90% of foodborne illness, including typhoid, cholera, dysentery, and hepatitis A. While these diseases have declined in industrialized countries, food contamination with salmonella and similar pathogens continues to rise.

**Sustainable environmental policies** are needed to deal with issues of soil degradation, erosion, deforestation, overgrazing, and other unsuitable land-use practices, as well as conservation of fuel and energy sources and protection of the habitat. Of particular concern to WHO are policies and actions regarding urbanization, pollution, and quality of food and water. Food contamination and water pollution resulting from unsafe and excessively intensive agricultural production methods are of increasing concern in many countries.

**Areas for action** include the development of environmentally sustainable approaches to improving food, nutrition, and health. Access of poor households to adequate resources have to be assured, so as to minimize any adverse environmental impact. Measures have to be taken to alleviate environmental health hazards, especially food- and water-borne diseases, and to promote lifestyles that do not threaten health or the environment over the long term.

## 1.2 Food and nutrition: A human-rights perspective

The right to food and nutrition, and the right to be free from hunger and malnutrition, have been expressed in two types of international human-rights instruments: conventions and covenants which are legally binding on those accepting them; and declarations which, though non-binding, exercise a measure of moral suasion on governments. However, it is only recently that the United Nations family of organizations has begun to consider the opportunities and advantages that a human-rights perspective can have in accelerating action against all forms of malnutrition.

The following international instruments, individually and collectively, provide the foundation for, and recognition of, the human rights to adequate food and nutrition, and to freedom from malnutrition.

- Half a century ago the **Universal Declaration of Human Rights** (1948) asserted that *“everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food ...”* (article 25(1)).
- This position is echoed in the **Constitution of the World Health Organization**, also adopted in 1948, which affirms that promoting the improvement of nutrition (article 2) is among the specific ways that WHO can achieve its objective, *“the attainment by all peoples of the highest possible level of health”* (article 1).
- The **International Covenant on Economic, Social and Cultural Rights**, which came into force in 1976, declares that *“The States Parties to the present covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing, and housing...”* (article 11).
- In 1981, the World Health Assembly adopted the **International Code of Marketing of Breast-milk Substitutes** which emphasizes providing *“safe and adequate nutrition for infants”* (article 1). On this occasion, the Member States of the World Health Organization affirmed *“the right of every child and every pregnant and lactating woman to be adequately nourished as a means of attaining and maintaining health”* (Code preamble, paragraph 1).
- In the **Convention on the Rights of the Child**, which came into force in 1990, two articles address the issue of nutrition. According to article 24, *“States Parties recognize the right of the child to the enjoyment of the highest attainable*

*standard of health... ”* and shall take appropriate measures *“... to combat disease and malnutrition through the provision of adequate nutritious foods and clean drinking-water. . . .”*

- Article 27 of the **Convention** says that States Parties *“shall in case of need provide material assistance and support programmes, particularly with regard to nutrition, clothing, and housing”*.
- In the **World Declaration on Nutrition**, adopted at the Joint FAO/WHO International Conference on Nutrition (Rome, 1992), the international community affirmed that *“access to nutritionally adequate and safe food is a right of each individual”*.
- In the **Rome Declaration on World Food Security** (World Food Summit, 1996) heads of state and governments reaffirmed *“the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger”*.

Increasingly, WHO and other intergovernmental and nongovernmental organizations are promoting a human-rights perspective to meeting the food and nutrition needs of all age and population groups.



## **SECTION 2**

# **MALNUTRITION**

## The global picture

- 2.1** The spectrum of malnutrition
- 2.2** Malnutrition across the life span
- 2.3** Malnutrition across the world: a vital reporting responsibility of WHO
- 2.4** Intrauterine growth retardation and maternal malnutrition
- 2.5** Protein-energy malnutrition
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  - Iodine deficiency disorders
  - Vitamin A deficiency
  - Iron deficiency and anaemia
  - Other micronutrient deficiencies
- 2.7** Overweight and obesity
- 2.8** Diet and cancer
- 2.9** Nutrition in transition: globalization and its impact on nutrition patterns and diet-related diseases





## 2.1 The spectrum of malnutrition

**Hunger and malnutrition** remain among the most devastating problems facing the majority of the world's poor and needy, and continue to dominate the health of the world's poorest nations. Nearly 30% of humanity—infants, children, adolescents, adults and older persons in the developing world—are currently suffering from one or more of the multiple forms of malnutrition. This remains a continuing travesty of the recognized fundamental human right to adequate food and nutrition, and freedom from hunger and malnutrition, particularly in a world that has both the resources and knowledge to end this catastrophe.

The tragic consequences of malnutrition include death, disability, stunted mental and physical growth and as a result, retarded national socio-economic development. Some **49% of the 10.7 million deaths among under-five children each year in the developing world** are associated with malnutrition. **Iodine deficiency** is the greatest single preventable cause of brain-damage and mental retardation worldwide. **Vitamin A deficiency** remains the single greatest preventable cause of needless childhood blindness.

At the same time, especially in rapidly industrializing and industrialized countries, a massive global **epidemic of obesity** is emerging in children, adolescents and adults, so that more than half the adult population is affected in some countries, with consequent increasing death rates from heart disease, hypertension, stroke, and diabetes. Diet is also a major causative factor in the problems of post-menopausal women and in many types of cancer.

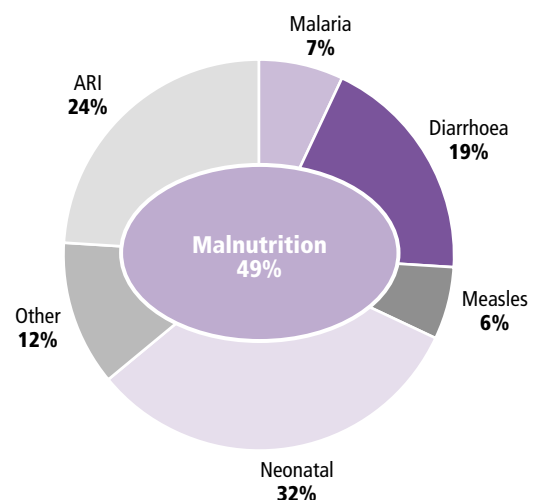
Other important nutrition issues affecting large population groups include:

- only **35% of infants ever exclusively breast-fed** between 0-4 months of age;
- poor **complementary feeding** practices very widespread—a major cause of childhood malnutrition;
- **scurvy, beriberi and rickets** in badly deprived and refugee populations;
- **folate deficiency** in women of child-bearing age and adolescent girls, causing three quarters of the cases of anaemia and neural tube defects;
- **zinc deficiency** in deprived populations, contributing to growth retardation, diarrhoea, immune deficiency, skin lesions;
- **selenium deficiency**, widespread in China and the Russian Federation, causing Keshan disease and Kashin-Beck disease.

### Current dimensions of some of the major forms of malnutrition and nutrition-related disease

Intrauterine growth retardation (IUGR)	30 million (23.8% of all births) per year
Protein-energy malnutrition (PEM)—underweight	150 million under-five children—slowly decreasing
Iodine deficiency disorders (IDD)	740 million—rapid progress towards elimination in some countries
Vitamin A deficiency blindness (VAD)	2.8 million under-five children slowly decreasing
Iron deficiency anaemia (IDA)	2 billion—especially women and children
Obesity	300 million adults—rapidly increasing; 17.6 million children in developing countries—increasing
Cancer (diet-related)	10.3 million cases of cancer per year, 3–4 million (30–40%) preventable by feasible appropriate diet and exercise
Malnutrition among older persons	540 million older persons—well over half—with some diet/nutrition-related degenerative disease; e.g., cardiovascular, cerebrovascular, diabetes, osteoporosis, cancer
Osteoporosis	2 million hip/spine fractures per year (80% in women). Calcium, vitamin D and exercise critical for prevention

FIGURE 1  
**Distribution of 10.7 million deaths among children under 5 years of age in all developing countries, 1995**



## 2.2 Malnutrition across the life span

Malnutrition affects **all age groups across the entire life span** (Table 1). From conception, throughout the fetal period and into early infancy, intrauterine nutrition has a profound influence on growth, development, morbidity, and mortality. Health implications range from intrauterine brain damage and growth failure through reduced physical and mental capacity in childhood to an increased risk of developing diet-related noncommunicable diseases later in life.

## 2.3 Malnutrition across the world: a vital reporting responsibility of WHO

One of the four main objectives of WHO’s Department of Nutrition for Health and Development is to develop and maintain **global nutrition databases** (see Section 6) for tracking the world’s major forms of malnutrition. WHO is in a unique position to carry out this crucial function.

The World Health Assembly requires it, the international community depends on it, and Member States regularly use it, for setting priori-

TABLE 1  
Malnutrition across the life span, by disorder and consequence

Life stage	Common nutritional disorders	Main consequences
Embryo/fetus	Intrauterine growth retardation Iodine deficiency disorders (IDD) Folate deficiency	Low birth weight Brain damage Neural tube defects Stillbirths
Neonate	Low birth weight IDD	Growth retardation Developmental retardation Brain damage Early anaemia
Infant and young child	Protein-energy malnutrition (PEM) IDD Vitamin A deficiency (VAD) Iron deficiency and anaemia (ID&A)	Continuing malnutrition Developmental retardation Increased risk of infection High risk of death Goitre Blindness Anaemia
Adolescent	PEM, IDD, ID&A Folate deficiency Calcium deficiency	Delayed growth spurt Stunted height Delayed/retarded intellectual development Goitre Increased risk of infection Blindness Anaemia Inadequate bone mineralization
Pregnant and lactating women	PEM, IDD, VAD, ID&A Folate deficiency Calcium deficiency	Insufficient weight gain in pregnancy Maternal anaemia Maternal mortality Increased risk of infection Night blindness Low birth weight/high-risk death rate for fetus
Adults	PEM, ID&A Obesity Diet-related diseases	Thinness Lethargy Obesity Heart disease Diabetes Cancer Hypertension/stroke Anaemia
Older persons	PEM, ID&A Obesity Osteoporosis Diet-related diseases	Obesity Spine/hip fractures, accidents Heart disease Diabetes Cancer

ties and assessing progress towards achieving goals. This section summarizes the current global and regional dimensions of the major forms of malnutrition.

## 2.4 Intrauterine growth retardation and maternal malnutrition

A formidable precursor of infant and young child malnutrition is fetal malnutrition, more formally described as intrauterine growth retardation (IUGR). In this context, IUGR is defined as weight below the 10th percentile of birth-weight-for-gestational-age reference curve.

IUGR is a **major clinical and public health problem in developing countries**, where an estimated 30 million newborns (23.8% of 126 million births per year) are affected every year (1). By contrast, the rate is only about 2% in developed countries.

In Table 2, estimated regional incidences are compared using the more traditional indicator of IUGR for full-term babies ( $\leq 2500$  g at 37 weeks gestation). These data, from 109 countries, show nearly 75% of all affected newborns are in Asia (mainly south-central Asia), followed by Africa and Latin America.

**Maternal malnutrition** is the major determinant of IUGR in developing countries, as evidenced by low gestational weight gain, low pre-pregnancy body mass index, and short maternal stature. Maternal anaemia, gastrointestinal and respiratory infections, malaria, and cigarette smoking are also important etiological factors.

IUGR demands urgent attention not only because of the significantly increased risks it poses for the infant and young child (e.g., increased malnutrition, morbidity, mortality, and poor cognitive and neurological development). It may also increase the risk of developing certain diseases later in adult life (e.g., cardiovascular disease, high blood pressure, obstructive lung disease, diabetes, and renal disease).

High rates of IUGR should be interpreted as an urgent public health warning of high risk of malnutrition and morbidity in women of childbearing age, and not merely as an indicator of a high risk of malnutrition, morbidity and mortality for the newborn. IUGR also reinforces the inter-generational cycle of malnutrition, poverty, and disease with enormous costs in terms of failed and unachieved human and socioeconomic development potential.

TABLE 2

**Estimated incidence of intrauterine growth retardation (IUGR) for full-term babies ( $<2500$  g birth weight at 37 or more weeks gestation): reflecting prevalence (%) and numbers of newborns affected per year**

Region	% $\leq 2500$ g at 37 weeks	Total numbers (thousands)
Middle Africa	14.9	554
Western Africa	11.4	1 001
Asia*	12.3	10 147
Latin America and the Caribbean	6.5	779
Oceania**	9.8	18
<b>Total developing countries</b>	<b>11.0</b>	<b>12 499</b>

\* Excludes Japan

\*\* Excludes Australia and New Zealand

## 2.5 Protein-energy malnutrition

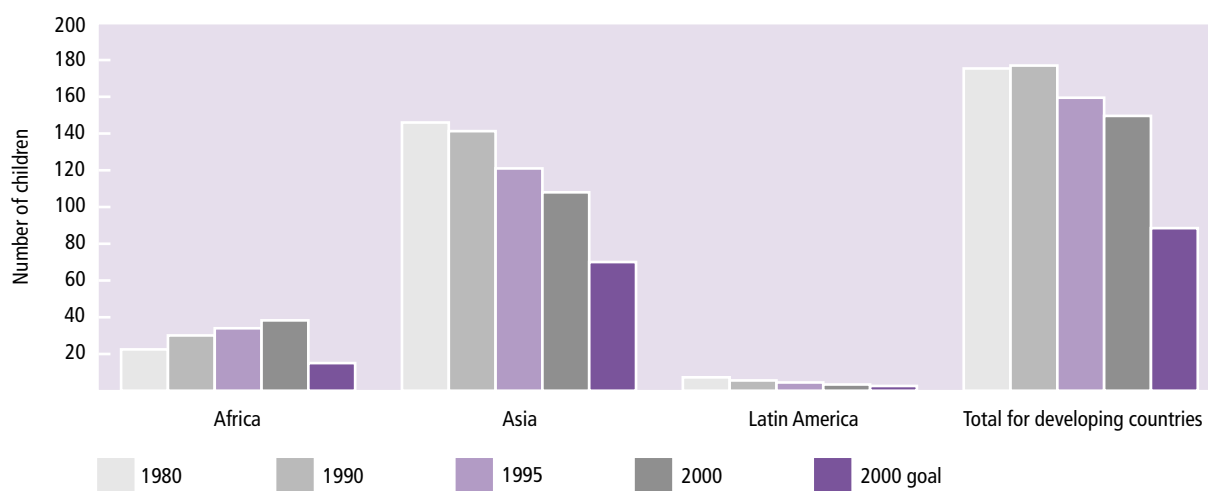
Overall progress during the last twenty years in reducing protein-energy malnutrition (PEM) among infants and young children has been exceedingly slow. It was not adequate even to approach the year-2000 goal of a 50% reduction in 1990 prevalence levels. During the 1990s, the projected goal had been to reduce global malnutrition to having no more than 16.1% (87 million) under-five children malnourished.

Currently, an estimated 149.6 million children under five years of age, i.e. 26.7% of the world's children in this age group, are still malnourished when measured in terms of weight for age. Nevertheless, this clearly represents significant progress when compared with the 175.7 million children—a prevalence of 37.4%—who were malnourished in 1980 (see Figure 2 and Table 3).

Although this continuing global burden of **malnutrition is rooted in poverty, underdevelopment, and inequality**, some of the additional reasons behind PEM's persistence can be found by looking at the regional trends and numbers of children affected. As an illustration, in some areas the drop in percentage prevalence has not been as rapid as the rise in population. In Africa for example, the actual number of malnourished children has in fact risen as a result of this population growth. In addition, natural disasters, wars, civil disturbances, and population displacement have all contributed to a continuous creeping increase in the already high prevalence of malnutrition in Africa.

FIGURE 2

**Regional and global trends in estimated numbers of underweight children <5 years**



Source: WHO Global Database on Child Growth and Malnutrition, 2000

TABLE 3

**Global and regional trends in the estimated prevalence of protein-energy malnutrition in underweight children under five, since 1980**

Region	1980		1990		1995		2000	
	%	Million	%	Million	%	Million	%	Million
Africa	26.2	22.5	27.3	30.1	27.9	34.0	28.5	38.3
Asia	43.9	146.0	36.5	141.3	32.8	121.0	29.0	108.0
Latin America	14.2	7.3	10.2	5.6	8.3	4.5	6.3	3.4
Developing countries	37.4	175.7	32.1	177.0	29.2	159.5	26.7	149.6

TABLE 4

**Global and regional trends in the estimated prevalence and numbers of stunted children under five years of age, since 1980**

Region	1980		1990		1995		2000		2000 Goal
	%	Million	%	Million	%	Million	%	Million	%
Africa	40.5	34.8	37.8	41.7	36.5	44.5	35.2	47.3	18.9
Asia	52.2	173.4	43.3	167.7	38.8	143.5	34.4	127.8	21.7
Latin America & the Caribbean	25.6	13.2	19.1	10.4	15.8	8.6	12.6	6.8	9.6
Developing countries	47.1	221.4	39.8	219.8	36.0	196.6	32.5	181.9	19.9

Source: WHO Global Database on Child Growth and Malnutrition, 2000.

Geographically, however, over two-thirds (72%) of the world's malnourished children live in Asia (especially **southern Asia**). This figure compares with the 25.6% found in **Africa** and only 2.3% in **Latin America**. An estimated 182 million children under 5 years of age, representing 32.5% of all preschool children in developing countries, are malnourished when measured in terms of height for age (i.e., stunted).

**Stunting** prevalence rates vary widely across nations. The **highest rates** can be found in **south-central Asia** and **eastern Africa**, where about half of the children suffer from some degree of growth retardation. In Latin America, the severity of stunting is considerably lower. The **trend in Africa is disturbing**, where the number of children who are stunted has been increasing, although the prevalence is decreasing. The health consequences of the current high prevalence of child growth retardation in developing countries are severe (see Table 4).

## Progress

High global prevalence rates for PEM conceal, in statistical averages, the **remarkable successes** being achieved by a substantial number of individual Member States. Many have made great strides, particularly since the International Conference on Nutrition in 1992, in allocating more resources to combat malnutrition.

For example, 49 of a total sample of 69 developing countries now show a measurable improvement in nutritional status—and thus declining rates of stunting—in their under-five populations. Fifteen such countries (of a subtotal of 31 in the region) are in Africa, 16 (of 19) are in Latin America, and 18 (of 19) are in Asia.

## 2.6 Micronutrient malnutrition

### 2.6.1 Iodine deficiency disorders (IDD)

Iodine deficiency disorders (IDD) **constitute the single greatest cause of preventable brain damage** in the fetus and infant, and of **retarded psychomotor development** in young children. IDD remains a major threat to the health and development of populations worldwide, but particularly among preschool children and pregnant women in low-income countries.

It results in goitre, stillbirth, and miscarriages, but the most devastating toll involves mental retardation, deaf-mutism and impaired educability. While cretinism is the most extreme manifestation, of considerably greater significance are the more

TABLE 5

### Number and prevalence of population affected by goitre\*

	Population affected by goitre			
	Population** millions	Millions	% of the region	% of global burden
Africa	612	124	20%	16.8%
The Americas	788	39	5%	5.2%
South-East Asia	1 477	172	12%	23.2%
Eastern Mediterranean	473	152	32%	20.5%
Europe	869	130	15%	17.5%
Western Pacific	1 639	124	8%	16.8%
Total	5 857	740	13%	100%

\* Ref: *WHO Global IDD Database* (to be published).

\*\* Based on UN population division (UN estimates 1997)

subtle degrees of mental impairment that lead to poor school performance, reduced intellectual ability, and impaired work capacity.

**Knowledge of the global magnitude of IDD** has improved considerably since 1990. In 1999, IDD was identified as a significant public health problem in 130 countries, affecting a total of 740 million people, or 13% of the world's population. The most affected regions, in decreasing order of magnitude, are Eastern Mediterranean (32%), Africa (20%), Europe (15%), South-East Asia (12%), Western Pacific (8%), and the Americas (5%) (Table 5). While remarkable measurable progress has been achieved, it is estimated that over 16 million cretins and nearly 50 million others are still affected by lesser degrees of IDD-related brain damage. **One-third of the world's population is estimated to be at risk of IDD.**

## Progress

In 1990, the World Health Assembly took a **pioneering step** in urging action by Member States to eliminate IDD as a public health problem. The Assembly subsequently reaffirmed this goal in 1993, 1996, and 1999. Most recently, a report by the Director-General on progress made by countries towards the elimination of IDD was presented to the Fifty-second World Health Assembly (May 1999).

The **main WHO intervention strategy** for IDD control—universal salt iodization (USI)—was adopted by the World Health Assembly in 1993,

TABLE 6

**Progress since 1990 in eliminating iodine deficiency disorders**

WHO region	Total number of countries	Countries with iodine deficiency disorders*	Legislation on universal salt iodization**	Number of countries with:			
				Monitoring		Progress towards universal salt iodization	
				Quality of iodized salt	Iodine status	Population coverage 10% to 50%	Population coverage above 50%
Africa	46	44	34	29	24	7	24
The Americas	35	19	17	19	19	3	16
South-East Asia	10	9	7	8	7	2	6
Europe	51	32	20	17	13	12	6
Eastern Mediterranean	22	17	14	14	10	2	9
Western Pacific	27	9	6	8	6	4	4
<b>Total</b>	<b>191</b>	<b>130</b>	<b>98</b>	<b>95</b>	<b>79</b>	<b>30</b>	<b>65</b>

\* Includes only countries where disorders are documented and have remained a public health problem since 1990. Excludes countries where there are no data, no reported problems of iodine deficiency disorders, or where such disorders have been eliminated or never existed.

\*\* In some countries, legislation was introduced before 1990.

and established as a World Summit for Children goal in 1995. Salt was chosen for a number of reasons. Two of these reasons are that it is widely consumed by most people in a population and that the costs of iodizing it are extremely low at around five US cents per person per year. In high-risk areas, where populations cannot be reached by iodized salt, the alternative is to administer iodine directly, either as iodide or iodized oil, with a focus particularly on women and children.

In the early 1980s, **only a few countries** were known to be affected by IDD and only a handful had IDD control programmes, usually using iodized oil supplementation. Over the last decade, extraordinary progress has been made in increasing the number of people consuming iodized salt.

Whereas in 1990, only 46 countries had salt iodization programmes, by 1998 the number had increased to 93, more than 80% of which have legislation on iodized salt. Overall, **more than two-thirds** of households living in IDD-affected countries now consume iodized salt, and 20 countries have reached the goal of USI (defined as more than 90% of households consuming iodized salt).

**Monitoring** is essential for the long-term success of salt iodization programmes. Seventy-three percent of IDD-affected countries monitor the quality of iodized salt, and 61% the iodine status of the population.

Salt iodization programmes have not been in place long enough to evaluate fully the impact of

USI on iodine status. Nevertheless, **it is clear** that where salt iodization has been implemented for more than five years, improvement in iodine status has been dramatic. This has been demonstrated in the last three years in Algeria, Cameroon, China, Colombia, Indonesia, Peru, Venezuela, and Zimbabwe, where WHO, UNICEF and ICCIDD have carefully assessed the situation.

### 2.6.2 Vitamin A deficiency (VAD)

Vitamin A deficiency (VAD) is a major public health problem, and again the most vulnerable are **pre-school children** and **pregnant women** in low-income countries. In children, VAD is the leading cause of preventable severe visual impairment and blindness. An estimated 250 000 to 500 000 VAD children become blind every year, and about half of them die within a year. In addition, VAD reduces resistance to infection, so that the risk of severe illness and death from common childhood infections, particularly diarrhoeal diseases and measles, significantly increases.

In communities where VAD exists, children are, on average, 23% more likely to die and 50% more likely to suffer acute measles. In women, VAD may be an important factor contributing to maternal mortality and to poor pregnancy and lactation outcomes, as well as night blindness. Finally, VAD is also likely to increase vulnerability to other disorders, such as anaemia, for both women and children, and growth deficits in children.



In VAD-prevalent countries, **pregnant women** often experience deficiency symptoms, such as night blindness, that continue into the early period of lactation. In some countries of South-East Asia, the prevalence of night blindness has been reported to be as high as 10-20% in pregnant women. For nursing infants, the breast milk they receive from deficient mothers is likely to contain insufficient vitamin A to build or even maintain vitamin A stores.

Furthermore, a number of studies have also highlighted the association of VAD with an elevated risk of HIV mother-to-child transmission. However the role of vitamin A supplements in the management of HIV infection is not yet clear and further research is required.

To date, it is estimated that vitamin A deficiency is a public health problem in 118 countries, 83 of which have reported data to WHO. Africa has the highest prevalence of clinical VAD while the highest number of clinically affected are in South-East Asia. Among the children under 5 years of age affected by VAD, some 3 million have ocular lesions of xerophthalmia and 100 to 140 million present only subclinical manifestations, yet live with a greater risk of mortality and of developing severe infections.

**Strategies for controlling** vitamin A deficiency aim to provide an adequate intake through a combination of dietary improvement including breastfeeding, supplementation, and food fortifi-

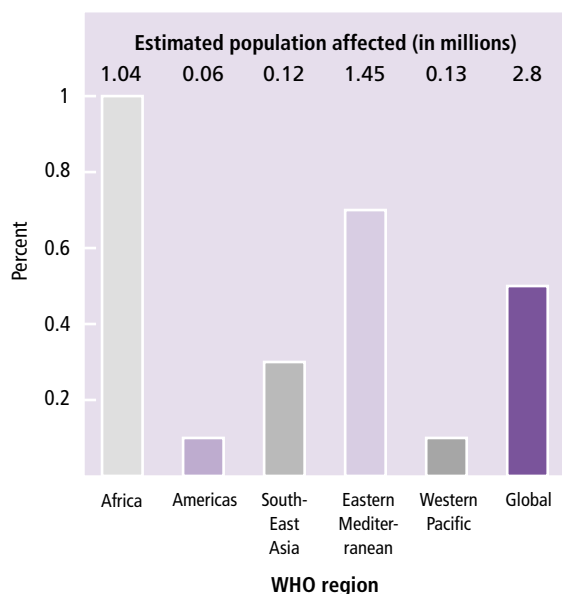
cation. The three approaches are complementary and their respective importance in VAD control policy will depend on the local conditions.

Improving vitamin A intake through **a better diet is the ideal solution**. In infants and young children, breastfeeding plays an essential role as the main source of vitamin A and therefore is instrumental in VAD reduction programmes. In older children and the rest of the population, the challenge is to make vitamin A-rich foods accessible and affordable, especially to vulnerable families. Home gardens growing vitamin A-rich fruits and vegetables, have been promoted successfully in some countries. Although dietary improvement is usually difficult to achieve in the short term, it is likely to be more sustainable than supplementation or fortification.

The periodic use of **high-dose vitamin A capsules** is a low-cost and highly effective means of improving vitamin A status and is the quickest intervention to implement on a national scale. There are numerous channels through which vitamin A supplements can be provided. In practice, immunization often provides one of the most reliable routine contacts with health services for mothers and their infants and the integration of vitamin A supplementation with both routine and campaign-based immunization is currently taking place in many countries. Food fortification with vitamin A is a central strategy for VAD reduction and it is now clear that this approach is increasingly feasible in developing countries and can also be accelerated more quickly from planning to implementation than was recently thought possible.

FIGURE 3

**Estimated percent of population of children under 5 years of age with ocular lesions due to vitamin A deficiency, by WHO region**



### Progress

The **elimination** of VAD as a public health problem and all its consequences, including blindness, was adopted as a goal by the World Summit for Children in 1990 and reiterated by the World Health Assembly in 1993. Since then, there has been progress in many countries in combating VAD.

In most VAD-affected countries, supplementation is the main component of a multiple approach being employed. In 1998, of the 89 countries where national immunization days took place, forty countries included vitamin A supplements in them. A number of these countries benefit from the support of a four-year project funded by the Micronutrient Initiative and implemented through WHO.

Moreover, an increasing number of countries are implementing food fortification programmes. In 1997, it was estimated that in about 30 countries vitamin A supplement coverage among children, or widespread access to fortified foods, was greater

than 50%. These estimates indicate considerable progress in a short time. However, measures to improve dietary intake by increasing production of vitamin A-rich foods, or by facilitating access to them, are still limited. Nearly 30% of countries where VAD is likely to be a public health problem have not yet estimated the magnitude of the deficiency, and therefore have not yet developed strategies for action.

### 2.6.3 Iron deficiency and anaemia (IDA)

Iron deficiency is **the world’s most widespread nutritional disorder**, affecting both industrialized and developing countries. In the former, iron deficiency is the main cause of anaemia. In developing countries, the risk of anaemia is worsened by the fact that iron deficiency is associated with other micronutrient deficiencies (folic acid, vitamins A and B<sub>12</sub>), parasitic infestations such as malaria and hookworm, and chronic infections such as HIV. In the poorest populations, the usual diet is not only monotonous but also based on cereals which are low in iron and contain high levels of absorption-inhibitors. In these cases, iron stores are characteristically low, particularly in young children and pregnant women.

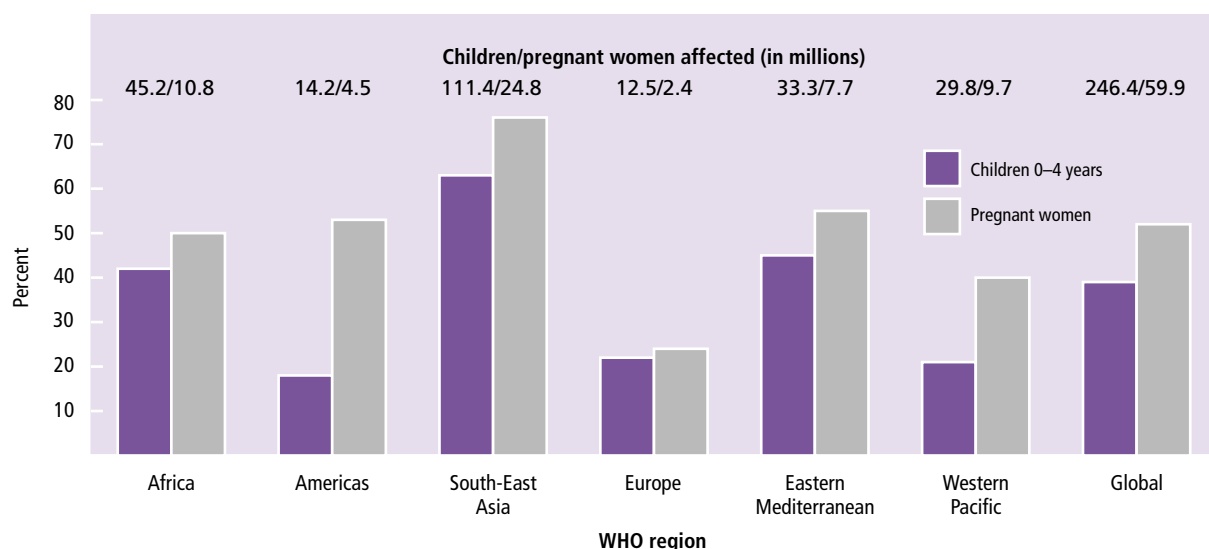
Iron deficiency has **profound negative effects** on human health and development. In infants and young children, it results in impaired psychomotor development, coordination and scholastic achievement, and decreased physical activity levels. In adults of both sexes, iron deficiency reduces work capacity and decreases resistance to fatigue. In pregnant women, iron deficiency leads

to anaemia that is associated with an increased risk of maternal mortality and morbidity, fetal morbidity and mortality, and intrauterine growth retardation.

While anaemia affects nearly 2000 million people worldwide, or about a third of the world’s population, iron deficiency may affect over twice as many. Overall, 39% of preschool children and 52% of pregnant women are anaemic, of whom more than 90% live in developing countries. In addition, many school-aged children are also anaemic, although the data currently available on this age group are fragmentary and therefore need to be interpreted cautiously. Iron deficiency and anaemia thus affect all age groups, and their far-reaching impact presents a true major hurdle to national development.

**Measures to prevent** iron deficiency should be part of an overall strategy to control anaemia. That strategy should be based on a combination of iron supplementation, dietary approaches, food fortification, and more general public health measures to address the other causes of anaemia. At present, the chief measure to control iron deficiency and anaemia in most countries consists of providing iron supplements to pregnant women and, less frequently, to young children. With regard to dietary improvement strategies, these are not often included in IDA control programmes. Their practical implementation is not always easy, since increasing the amount of bioavailable iron in the diet implies ensuring access to foods which are usually unaffordable or even frequently unavailable to population groups at risk of iron deficiency. These sources include, for example, animal foods and

FIGURE 4  
**Estimated population affected by anaemia and iron deficiency, by WHO region**





fresh fruits and vegetables. As a result, it is encouraging to note that more and more countries are embarking on iron fortification programmes.

### Progress

Unfortunately, there has been **little appreciable change** over the last two decades in the high worldwide prevalence of IDA. Few active programmes in both developed and developing countries have succeeded in reducing iron deficiency and anaemia. Important factors contributing to the lack of progress include failure to recognize the causes of iron deficiency and anaemia, lack of political commitment to control it, inadequate planning of control programmes, insufficient mobilization and training of health staff, and insufficient community involvement in solving the problem.

In order to reactivate IDA country programmes, WHO has organized several intercountry meetings in the Africa, Asia, and Eastern Mediterranean Regions. In addition, and in close collaboration with other partners, it addressed through operational research and expert consultation some of the major issues related to the implementation of IDA control programmes.

#### 2.6.4 Other micronutrient deficiencies

Several other forms of malnutrition, or nutrition deficiency disorders, affect large and often vulnerable population groups worldwide. **Action is urgently required** on the following:

**Folate deficiency**, which causes widespread megaloblastic anaemia in pregnancy and often compounds already existing iron deficiency anaemia. Folate deficiency is also associated with elevated plasma homocysteine levels and is thus recognized as an independent risk factor for coronary heart disease and stroke. It is also associated with the occurrence of neural tube defects (anencephaly and spina bifida) in high-risk population groups across the world including in Europe, the Middle East and China. Low folate status is also associated with cancer, especially of the colon.

**Zinc deficiency**, which causes growth retardation or failure, diarrhoea, immune deficiencies, skin and eye lesions, delayed sexual maturation, and behavioural changes. Zinc is involved in over 200 enzyme reactions, and has a critical role to play in the structure and functioning of biomembranes, and in stabilizing DNA, RNA and ribosomal structures. Zinc supplementation of malnourished infants and growth-retarded young children has resulted in improved growth. Other functions that have responded to zinc supplementation include:

- immune functions in older persons; and
- complications of pregnancy such as prematurity, prolonged labour, pregnancy-induced hypertension, and intrapartum haemorrhage.

There are growing indications that **mild zinc deficiency** may be far more widespread than previously thought. There is evidence, for example, that zinc deficiency may cause intrauterine growth retardation and even neural tube defects in the fetus, that it may affect taste acuity, and that it can cause dermatitis and impaired immune function in the elderly.

**Calcium deficiency and osteoporosis.** Inadequate dietary calcium intake is associated with a number of common, chronic medical disorders worldwide, including osteoporosis, osteoarthritis, cardiovascular disease (hypertension and stroke), diabetes, dyslipidaemias, hypertensive disorders of pregnancy, obesity, and cancer of the colon.

**Calcium**, which is a major component of mineralized tissues, is required for normal growth and skeletal development. Optimal calcium intake is important to maximize and maintain peak adult bone mass and to minimize bone loss among older persons, both of which are key to reducing the risk of osteoporosis. Calcium requirements vary. The greatest needs are during the period of rapid growth in adolescence, during pregnancy and lactation, and in later adult life. Because 99% of total body calcium is found in bone tissue, calcium need is largely determined by skeletal requirements.

**Osteoporosis** is the result of a complex series of events in which the relative importance of dietary calcium is unclear. The literature contains many conflicting references to the efficacy of calcium supplementation in preventing and mitigating osteoporosis. Complicating matters further is the suggestion that a dietary calcium intake not all that different from proposed dietary levels can cause a number of adverse biological effects.

The situation becomes even more confused when observed from **a global perspective**. While trends generally suggest an inverse relationship between calcium intake and incidence of osteoporosis, the relationship is not always as strong as theory predicts. Thus, in some countries, relatively low intakes of calcium do not result in substantial increases in the incidence of osteoporosis. Part of the problem may be that the role of other factors, for example hormone levels and exercise, may be more important than dietary calcium alone.

Nevertheless, with the growing size of older populations worldwide and the very high prevalence of spine and hip fractures due to osteoporosis, particularly in post-menopausal women, it has

been proposed that **calcium supplementation** be considered on a worldwide basis. Such a widespread fortification policy would have to be based on rigorous criteria that consider both positive and negative consequences, and the issue is thus not so much one of risk-benefit as risk-risk. Such an undertaking would involve most of the vital policy issues associated with diet and nutrition work, and would require the development of data at the very frontiers of contemporary nutritional research.

**Selenium deficiency** has been identified in significant population groups, for example in China, New Zealand, and the Russian Federation. One of its manifestations is Keshan disease, a selenium-responsive endemic cardiomyopathy resulting in heart failure, which affects mainly children and women of childbearing age in certain areas of China. An increased incidence of Keshan disease has been associated with low selenium levels in staple cereals and in samples of human blood, hair, and tissue. Moreover, several field trials of selenium supplementation involving thousands of children provide strong evidence for selenium's prophylactic effect against Keshan disease.

In addition, selenium deficiency has been identified as the cause of an endemic osteoarthropathy, Kashin-Beck disease, which primarily affects children between the ages of 5 and 13 years living in certain regions of China and the former Soviet Union. Advanced cases of the disease are characterized by enlargement and deformity of the joints.

As with many trace elements, there is much work to be done to define low selenium status and its public health significance and to develop monitoring techniques for early detection of both under- and over-exposure to dietary selenium. Data are also needed to define acceptable upper limits for selenium intake for infants, children, adolescents, and pregnant and lactating women.

**Beriberi, pellagra, and scurvy.** Among the extremely poor and underprivileged, outbreaks of beriberi, pellagra, and scurvy still occur, not infrequently in large refugee populations.

**Beriberi** (thiamine deficiency) occurs where the diet is poor and unbalanced. Such a diet typically consists largely of milled white cereals, including polished rice and white flours, or starchy staple foods such as cassava and tubers, which are all very poor sources of thiamine. This deficiency disease, which can manifest itself within twelve weeks of deficient intake, can cause disability and death. In fact during the late 19th and early 20th centuries, when it was especially prevalent, thousands of men, women, and children died as a result.

Today, outbreaks of beriberi continue to occur in refugee settings. Examples include Thailand

(early 1980s), Guinea (1990), Eastern Ethiopia (1993), Djibouti (1993–1994), and Nepal (1993–1995). Large segments of the world's population continue to subsist on marginal or sub-marginal thiamine intakes. Those exposed to subclinical conditions of thiamine deficiency are much more likely to be predisposed to beriberi under appropriate circumstances, occasionally in epidemic proportions as in the Gambia in 1988 and 1990.

**Pellagra** is due to a lack of the vitamin niacin and its precursor tryptophan, which is an essential amino acid. Pellagra is common in populations where maize is the principal cereal. When a niacin- and/or tryptophan-deficient diet is consumed, the lead time for developing signs of pellagra is about 2 to 3 months.

Pellagra accounted for at least half a million deaths, and caused chronic misery for many more, between 1730 and 1930. Outbreaks of pellagra have been reported since 1988 in refugee camps in Angola, Ethiopia, Malawi, Nepal, Swaziland, the former Zaire, and Zimbabwe. In Malawi, the deficiency was considered to be equally as prevalent in the surrounding communities as in the refugee camps themselves.

Outbreaks of **scurvy** (vitamin C deficiency) also continue to occur in such populations. The prevention of this deficiency has been a renewed concern for nutrition and health professionals for well over a decade, and one of the main subjects discussed at a WHO workshop on improving the nutrition of refugees and displaced people in Africa (Machakos, Kenya, December 1994).

In 1982, an outbreak of scurvy was reported among Ethiopian refugees in Somalia. Various strategies were proposed, for example the distribution of vitamin C tablets and fresh fruits and vegetables, and fortification of basic foods. Outbreaks of scurvy have continued to occur, for example in Sudan (1984 and 1991), Somalia (1985), Ethiopia (1989), Nepal (1992) and Kenya (1994). The major refugee organizations and NGO emergency networks look to WHO for technical guidance for diagnosis, prevention and management of such nutrition emergencies.

## 2.7 Overweight and obesity

### An emerging epidemic

Emerging evidence strongly suggests that overweight and obesity have **reached epidemic proportions globally**. Not only are overweight and obesity increasing worldwide at an alarming rate, but both developed and developing countries are seriously affected. Moreover, as the problem

appears to be increasing rapidly in children as well as in adults, the true health consequences may only become fully apparent later. Based on current information, the following key points are causes for considerable concern:

- Obesity prevalence is increasing worldwide at an alarming rate in both developed and developing countries.
- In many developing countries, obesity co-exists with undernutrition (body mass index: BMI <18.5). Obesity is still relatively uncommon in Africa and Asia, and it is more prevalent in urban than in rural populations, but in economically advanced regions, prevalence rates may be as high as in industrialized countries.
- Women generally have higher rates of obesity than men, although men may have higher rates of overweight.
- The current lack of consistency and agreement between different studies over the classification of obesity among children and adolescents makes it difficult to provide an overview of the global prevalence of obesity for younger age groups. Nevertheless, by whatever classification system used, studies investigating obesity during childhood and adolescence have generally reported increasing prevalence.

**Lack of a common measurement standard** for defining overweight in children and adolescents has made it difficult to assess the global magnitude of obesity in children. Commonly used criteria include >85th percentile, >120% weight for height, and >+2SD above the reference median weight for height.

The WHO standard is >+2SD above reference median weight for height. By this standard, nationally representative data from 160 developing countries and some industrialized countries suggest that approximately 18 million under-five children are overweight. Available data for children and adults are presented in Table 7.

**Obesity in school children** is already approaching 10% in industrialized countries, e.g., Japan, the USA, and some European countries. High rates are also evident in those countries which are going through rapid transition, e.g. Algeria, Argentina, Armenia, Bolivia, Chile, China, Egypt, Indonesia, the Islamic Republic of Iran, Kiribati, Morocco, Peru, South Africa, Uzbekistan, and many Caribbean countries. Overweight and obesity during childhood leads to an increased likelihood of becoming overweight and obese in adulthood, as

TABLE 7

**Regional and global prevalence and numbers of overweight children under five years of age and adults, by WHO region**

WHO region	Children >+2SD above median wt/ht		Adults (BMI≥30)	
	% prevalence	Millions	% prevalence	Millions
Africa	3.4	3.3	2.9	8.2
The Americas	4.5	3.4	20.9	109.0
South-East Asia	4.5	3.0	1.1	10.0
Europe	NA	NA	16.7	106.5
Eastern Mediterranean	1.8	3.0	10.0	24.9
Western Pacific	4.0	5.3	3.8	42.5
<b>Global</b>	<b>3.6</b>	<b>21.5</b>	<b>8.2</b>	<b>301.1</b>

Total for children includes an estimated 3.5 million overweight children in Europe, although Europe survey data not always adequate.

well as an increased prevalence of obesity-related disorders.

For **adults**, the prevalence of obesity is 10% to 25% in most countries of Western Europe, 20% to 25% in some countries in the Americas, up to 40% in some countries in Eastern Europe, and more than 50% in some countries in the Western Pacific. In 1995, there were an estimated 200 million obese adults worldwide and as of 2000, the number of obese adults has increased to over 300 million. Obesity is one of the **key risk factors** for a range of serious noncommunicable diseases. These include cardiovascular disease, hypertension and stroke, non-insulin dependent diabetes mellitus (NIDDM), various forms of cancer and other gastrointestinal and liver diseases, varicose veins, and gall-bladder disease, as well as accidents and other serious problems.

In particular, obesity is the most important **modifiable risk factor** for NIDDM. The risk of NIDDM increases progressively with increasing body mass index (BMI). Recent estimates suggest that a BMI over 25 is responsible for 64% of male and 77% of female cases of NIDDM. Therefore, the global estimate of a 122% rise (from 135 to 300 million) in the number of adults affected by diabetes mellitus between 1995 and 2025 could be halted if effective public health strategies for prevention and control of overweight and obesity were to be developed and implemented.

**A major repercussion** of this obesity, the rate of which is doubling every 5–10 years in many parts of the world, is the significant additional **financial**

**burden on health systems.** In fact, the medical burden of obesity already threatens to overwhelm health services. Several industrialized countries have become so concerned about obesity that they are developing national prevention and management strategies. Indeed, global epidemic projections for the next decade are so serious that public health action is now urgently required. Moreover, analyses demonstrate that merely concentrating on children and adults who have a high BMI and associated health problems will not stem the escalating numbers of people entering the medically defined categories of ill-health. The spectrum of such problems, seen in both developing and developed countries, is having such a negative

impact that obesity should be regarded as one of **today's major neglected public health concerns.** New preventive public health strategies, that have an impact on the entire society, are needed.

## 2.8 Diet and cancer

Despite the enormous number of people affected, cancer is mostly **a preventable disease.** Yet, the global incidence of cancer is projected to rise from 10.3 million cases annually in 1996 to some 14.7 million by 2020. In July 1997 the World Cancer Research Fund and the American Institute for Cancer Research undertook an in-depth review of

TABLE 8  
**Common cancers**

Cancer	Global ranking (incidence)	Global incidence (1000s)	Evidence of decreased risk*	Dietary factors	Non-dietary risk factors (established)	Preventable by diet			
						Low estimate (1000s)	Low estimate (%)	High estimate (1000s)	High estimate (%)
Lung	1	1320	+++	Vegetables and fruits	Smoking Occupation	264	20	436	33
Stomach	2	1015	+++	Vegetables and fruits Refrigeration Salt Salted foods	H. pylori	670	66	761	75
Breast	3	910	++	Vegetables Rapid early growth Early menarche Obesity Alcohol	Reproductive Genes Radiation		300	33	761
Colon, rectum	4	875	+++	Vegetables Physical activity Meat Alcohol	Smoking Genes Ulcerative colitis S. sinensis NSAIDs	578	66	656	75
Mouth and pharynx,5 nasopharynx		575	+++	Vegetables and fruits Alcohol Salted fish	Smoking Betel EBV	190	33	288	50
Liver	6	540	+	Alcohol Contaminated food	HBV and HCV	178	33	356	66
Cervix	7	525	+	Vegetables and fruits	HPV Smoking	53	10	105	20
Oesophagus	8	480	+++	Vegetables and fruits Deficiency diets Alcohol	Smoking Barrett's oesophagus	240	50	360	75
<b>Total (1996)</b>		<b>10 320</b>				<b>3022</b>	<b>29.3</b>	<b>4187</b>	<b>40.6</b>

\*Possible decreased in risk + Probable decrease in risk ++ Convincing decrease in risk +++

Source: Food, nutrition and the prevention of cancer: a global perspective. World Cancer Research Fund/American Institute for Cancer Research, July 1997.

current scientific and expert literature linking food, nutrition and their effect on risk of human cancers (Table 8).

The panel of experts, which also consulted with WHO, IARC, and FAO in producing its report, made the following judgements based on current scientific evidence:

- Between 30% and 40% of all cases of cancer are preventable by feasible and appropriate diets, physical activity and maintenance of appropriate body weight.
- On a global basis and at current rates, this means that appropriate diets may prevent 3–4 million cases of cancer every year.
- Diets containing substantial and varied amounts of vegetables and fruits will prevent 20% or more of all cases of cancer.
- Keeping alcohol intake within recommended limits will prevent up to 20% of cases of cancer of the aerodigestive tract, the colon and rectum, and the breast.
- Cancer of the stomach is mostly preventable by appropriate diets; cancer of the colon and rectum is mostly preventable by appropriate diets and by maintaining or increasing physical activity and maintaining appropriate body weight.
- A feasible intermediate target for the dietary prevention of cancer is the reduction of global incidence by 10% to 20% within 10–25 years.

The scientific evidence clearly challenges WHO to redouble its efforts to support countries in developing appropriate food-based dietary guidelines. Some of this evidence is presented on the opposite page.

## 2.9 Nutrition in transition: globalization and its impact on nutrition patterns and diet-related diseases

Rapid changes in diets and lifestyles resulting from **industrialization, urbanization, economic development** and **market globalization** are having a significant impact on the nutritional status of populations. The processes of modernization and economic transition have led to industrialization in many countries and the development of economies that are dependent on trade in the global market. While results include improved standards of living and greater access to services, there have also been significant negative conse-

quences in terms of inappropriate dietary patterns and decreased physical activities, and a corresponding increase in nutritional and diet-related diseases.

Food and food products have become commodities produced and traded in a market that has expanded from an essentially local base to an increasingly global one. Changes in the world food economy have contributed to shifting dietary patterns, for example increased consumption of an energy-dense diet high in fat, particularly saturated fat, and low in carbohydrates. This combines with a **decline in energy expenditure** that is associated with a sedentary lifestyle, with motorized transport, and labour-saving devices at home and at work largely replacing **physically demanding** manual tasks, and leisure time often being dominated by physically undemanding pastimes.

Because of these changes in **dietary and lifestyle patterns**, diet-related diseases—including obesity, diabetes mellitus, cardiovascular disease, hypertension and stroke, and various forms of cancer—are increasingly significant causes of disability and premature death in both developing and newly developed countries. They are taking over from more traditional public health concerns like undernutrition and infectious disease, and placing additional burdens on already overtaxed national health budgets.

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## **SECTION 3**

The Department of

# **NUTRITION FOR HEALTH AND DEVELOPMENT**

**3.1** Mandate and vision

**3.2** A multisectoral framework for national and international action

**3.3** Aim and objectives

**3.4** Seven priority areas for action





### 3.1 Mandate and vision

Because of the fundamental role nutritional well-being plays in health and human development, and the worldwide magnitude of malnutrition-related mortality and morbidity, WHO has always included nutrition promotion, and the prevention and reduction of malnutrition, among its key **health-promotion** instruments.

#### Mandate

- Article 2 of the **Constitution of the World Health Organization** (1948) specifically includes the improvement of nutrition among the declared functions of WHO.
- The **Declaration of Alma Ata** (1978) lists promotion of food and nutrition as one of the eight essential elements of primary health care.
- The **Global Strategy for Health for All** (1981) features nutrition as one of its cornerstones, and three of its twelve monitoring indicators are nutrition-related.
- The **World Summit for Children** (1990) identified eight nutrition goals for the year 2000.
- The **World Declaration and Plan of Action for Nutrition** (1992), with 9 goals and 9 action areas, was endorsed in its entirety by the World Health Assembly.
- The **Forty-eighth World Health Assembly** (May 1995) identified nutrition as one of WHO's priority programme areas.
- **Health-for-All in the Twenty-first Century** (1998) includes malnutrition (stunting), and iodine and vitamin A deficiencies, among its specific targets for the year 2000.

#### Vision

**Our vision** is of a world where people everywhere, at every age, enjoy a high level of nutritional well-being, free from all forms of hunger and malnutrition.

**It is founded** on the intrinsic value of human life and the dignity it commands, as reflected in the international human-rights instruments adopted over the last half century. Everyone, without distinction of age, sex or race, has the right to nutritionally adequate and safe food and to be free from hunger and malnutrition.

**It rests** on the conviction that hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this widespread, continuing human catastrophe. It recognizes that hunger and malnutrition are rooted in poverty, deprivation and underdevelopment, and are the result of inadequate access to the basic requirements for nutritional well-being including safe and adequate food, care, health, education, and a clean environment.

**WHO**, with its health-sector focus, has a major responsibility for promoting healthy nutrition for all the world's people, through collaborative support to Member States, particularly in their national nutrition programmes, in partnership with other intergovernmental and nongovernmental organizations, and their related sectoral approaches.

### 3.2 A multisectoral framework for national and international action

After more than two years of extensive preparatory work by governments and their international organizations, WHO and FAO convened the International Conference on Nutrition (ICN) in Rome (1992). Through this process, the major forms of malnutrition were assessed, their multisectoral causes and contributing factors characterized, and the strategies and responsibilities for reducing malnutrition identified, as a basis for concerted national and international action.

**The World Declaration and Plan of Action for Nutrition** that the world's governments adopted at the ICN identifies nine goals and nine strategies as global priority nutrition action areas. The World Health Assembly subsequently endorsed these goals and strategies in their entirety (resolution WHA46.7). The World Declaration (following page) and Plan of Action characterize the multisectoral causality and nature of all types of malnutrition, as well as the multisectoral, multi-programmatic strategies and responsibilities of governments and the international community for reducing and eliminating malnutrition. At the same time, the goals and strategies form a **concise prioritized framework**, which serves as a platform from which WHO's own health-focused objectives, strategies and activities can be mutually reinforced.

**The World Food Summit** in Rome (1996) reiterated and reinforced the validity of these goals and strategies. It also provided an exceptional opportunity to reaffirm the commitment to achieving

food and nutrition security for all, to build on the efforts already made in implementing the ICN World Declaration and Plan of Action for Nutrition, and to invest resources effectively at national, regional, and global levels to accelerate the transition of national nutrition plans into meaningful action and visible results.

## World declaration for nutrition

### Nine goals

As a basis for the Plan of Action for Nutrition and guidance for formulation of national plans of action, including the development of measurable goals and objectives within time frames, we [the Ministers and Plenipotentiaries] pledge to make all efforts to eliminate before the end of this decade:

- famine and famine-related deaths;
- starvation and nutritional deficiency diseases in communities affected by natural and man-made disasters;
- iodine and vitamin A deficiencies.

We also pledge to reduce substantially within this decade:

- starvation and widespread chronic hunger;
- undernutrition, especially among children, women, and older persons;
- other important micronutrient deficiencies, including iron;
- diet-related communicable and noncommunicable diseases;
- social and other impediments to optimal breastfeeding; and
- inadequate sanitation and poor hygiene, including unsafe drinking water.

### Nine action-oriented strategies

- incorporating nutritional objectives, considerations and components into development policies and programmes;
- improving household food security;
- protecting consumers through improved food quality and safety;
- preventing and managing infectious diseases;
- promoting breastfeeding;
- caring for the socioeconomically deprived and nutritionally vulnerable;
- preventing and controlling specific micronutrient deficiencies;
- promoting appropriate diets and healthy lifestyles; and
- assessing, analysing and monitoring nutrition situations.

## 3.3 Aim and objectives of NHD

The **overarching aim** of WHO's work in nutrition, spearheaded by the Department of Nutrition for Health and Development (NHD), is **to prevent, reduce and eliminate malnutrition worldwide**, (especially protein-energy malnutrition; iodine, vitamin A, and iron deficiencies; obesity and diet-related diseases; and other specific deficiency diseases), and **to promote sustainable health and nutritional well-being of all people**, thereby reinforcing and accelerating human and national development.

The **four main objectives** in support of this aim are:

**Objective 1:** To strengthen and support the capabilities and effectiveness of Member States for assessing and addressing nutrition, malnutrition, and diet-related problems, primarily through the development and implementation of national nutrition policies, programmes, and plans of action.

**Objective 2:** To develop, through consultation, research and collaboration, the scientific knowledge base, methodologies, authoritative standards, norms and criteria, and guidelines and strategies for detecting, preventing, and managing all major forms of malnutrition, whether of deficiency or excess, for application by Member States.

**Objective 3:** To promote optimal sustainable health and nutrition benefits of food-assisted development projects targeted to the vulnerable food-insecure, particularly by ensuring the relevance and effectiveness of WFP food aid policies and programmes, in both emergency and development contexts.

**Objective 4:** To maintain global databases for monitoring, evaluating, and reporting on the world's major forms of malnutrition, the effectiveness of nutrition programmes, and progress towards achieving targets at national, regional and global levels.

## 3.4 Seven priority areas for action

Consistent with WHO's commitment to the goals and strategies of the World Declaration and Plan of Action for Nutrition (1992) and their reinforcement by the World Food Summit (1996), and given the Organization's health-sector emphasis, NHD works through seven priority areas for action. The first

three focus on **major forms of malnutrition**, while the second four concentrate on **programmatic approaches** for preventing or managing the main types of malnutrition. Together, these priority areas represent carefully chosen, interlinked approaches that ensure a comprehensive programme of WHO support to Member States:

### Malnutrition priorities

1. **Protein-energy malnutrition:** assessment, monitoring, management, prevention, and reduction.
2. **Micronutrient malnutrition:** assessment, monitoring, prevention, reduction, and elimination of:
  - iodine deficiency disorders;
  - vitamin A deficiency;
  - iron deficiency and anaemia; and
  - other specific and trace-element deficiencies.
3. **Obesity and other diet-related diseases:** epidemiology, prevention, management, and control.

### Programmatic priorities

4. **Developing and implementing national policies and plans of action for nutrition:** monitoring and implementing national nutrition plans and household food and nutrition security, and caring for the nutritionally vulnerable.
5. **Protecting and promoting sound infant and young child feeding practices:** breastfeeding (implementing the Baby-friendly Hospital Initiative and the International Code of Marketing of Breast-milk Substitutes), HIV and infant feeding, and appropriate complementary feeding.
6. **Managing nutrition in emergencies:** emergency preparedness and nutritional assessment, management, monitoring, and evaluation in emergencies.
7. **Food aid for development:** health and nutrition technical assessment, and evaluation and guidance to food-assisted development projects worldwide, particularly those of the World Food Programme (WFP).



## **SECTION 4**

# **ACTIVITIES AND OUTPUTS**

1999–2000

### **4.1** Development and implementation of national nutrition policies and plans

African Region

South-East Asia Region

European Region

Western Pacific Region

Global progress in developing and implementing national nutrition policies and plans of action

Preparation of training modules

### **4.2** Management of severe malnutrition

### **4.3** Control of micronutrient malnutrition

Iodine deficiency disorders (IDD)

Support for national IDD programmes

African Region

Region of the Americas

South-East Asia Region

Eastern Mediterranean Region

European Region

Western Pacific Region

WHO's normative role

Vitamin A deficiency (VAD)

Support for national VAD programmes

African Region

South-East Asia Region

Eastern Mediterranean Region

WHO's normative role

Iron deficiency and anaemia (IDA)

Support for national IDA programmes

South-East Asia Region

Eastern Mediterranean Region

European Region

WHO's normative role

Folate deficiency

**4.4** Prevention and management of obesity

**4.5** Promotion of sound infant and young child feeding practices

The Baby-friendly Hospital Initiative

Breastfeeding promotion: gaining support of policy-makers and hospital administrators

The Innocenti Declaration: reaching the targets

HIV and infant feeding

Global Technical Consultation on Infant and Young Child Feeding

The International Code of Marketing of Breast-milk

Substitutes: summary of recent action in countries

Complementary feeding

An evaluation of the infant-feeding content of medical textbooks

**4.6** Nutrition in emergencies

**4.7** Food aid for development

**4.8** Emerging issues of growing public health importance

Adolescent nutrition: a neglected dimension

Ageing and nutrition: a growing global challenge

## 4.1 Development and implementation of national nutrition policies and plans

Most of the **major priority strategies** that countries typically include in their nutrition plans—for example, incorporating nutrition into national development policies, protecting and promoting breastfeeding, and preventing and reducing micronutrient deficiencies (such as deficiencies of vitamin A, iodine and iron)—are considered individually later in this report.

Most of the **nutrition activities** focused on by WHO—whether concerning micronutrient deficiencies, protein-energy malnutrition, infant and young child feeding, obesity, nutrition and ageing, or development of food-based dietary guidelines—are incorporated by governments in national nutrition policies or plans of action for nutrition. This is how governments deal with malnutrition, in all its forms, which underscores the importance, reiterated in the World Declaration and Plan of Action for Nutrition, for all countries to develop and implement coherent national plans and policies in order to tackle nutritional problems in a comprehensive manner.

### WHO support for developing comprehensive multisectoral national nutrition policies, plans, and programmes

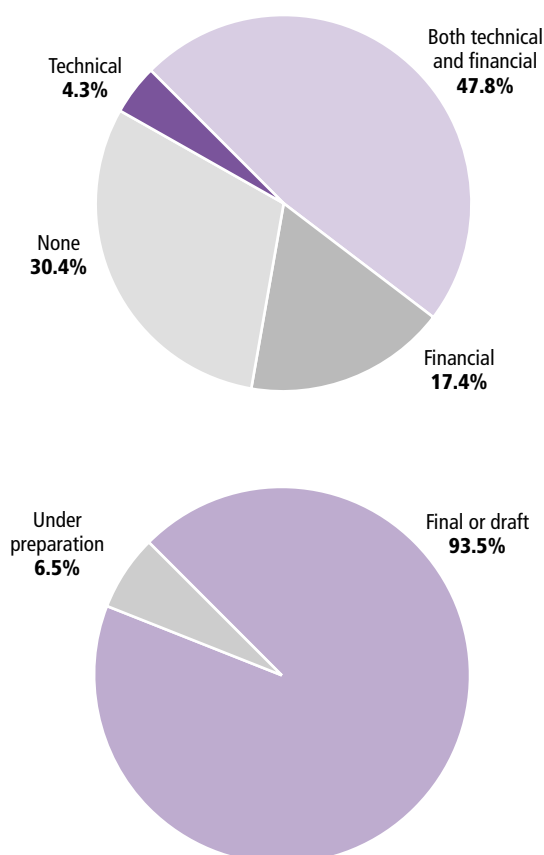
Through its six regional nutrition programmes, WHO provides both technical and financial support to Member States for developing, strengthening, and implementing their national nutrition plans of action. The **following section details the global progress** made by countries in developing and implementing their national nutrition policies and plans of action, and information on progress for some of the regions.

#### 4.1.1 African Region

**During 1996–2000**, WHO provided technical and/or financial support to nine countries to develop and implement their national nutrition plans of action: Angola (1996), Botswana (1996 and 1997), Burundi (1997), Cape Verde (1997), Chad (1996), Gabon (1999), Gambia (1999), Kenya (1997), Liberia (1997), Mali (1997), and Swaziland (1996).

As a result, **eight additional countries** have now finalized their national nutrition plans of action. Thus, 43 out of 46 (94%) Member States in the African Region have developed or strengthened their national plans of action for nutrition and 3 of those remaining are currently finalizing their plans.

FIGURE 5  
**WHO support and status of plans of action in the African Region**



### Future action

WHO's Regional Office for Africa, in close collaboration with FAO regional and sub-regional offices, is planning to hold **two regional meetings in 2000**—one for Francophone countries and the other for Anglophone countries. The purpose of these meetings will be to review progress and experiences of countries in developing and implementing national nutritional plans and policies; emerging priority issues; constraints faced by countries; key elements for successful implementation; and lessons learned and the way forward, including additional actions and support required for implementing national plans of action.

#### 4.1.2 South-East Asia Region

**Seventy-nine percent** (this figure is based on the SEARO country profile document) of the world's malnourished children live in the South-East Asia Region. During 1996–2000, WHO provided technical assistance for upgrading national nutrition and food safety programmes to all ten Member States

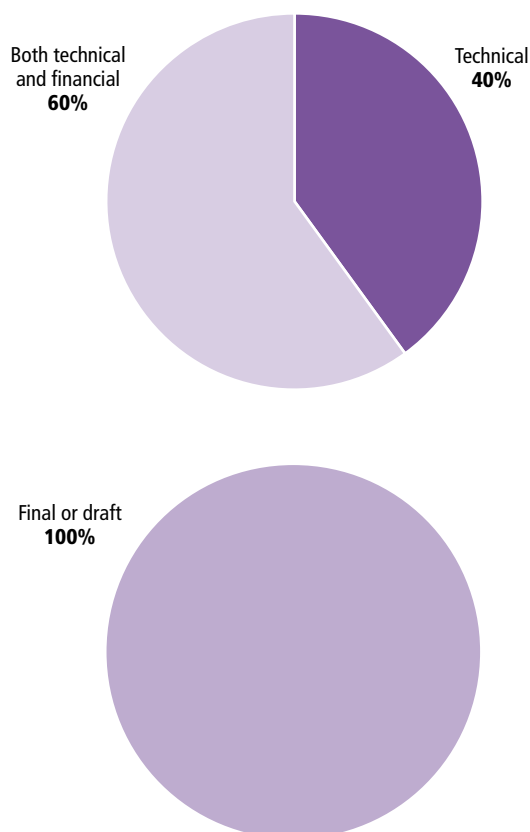
in this Region. These are Bangladesh, Bhutan, Democratic People’s Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Thailand.

In addition, WHO’s Regional Office for South-East Asia convened, in close collaboration with FAO and UNICEF, a **major Regional consultation in December 1999** to review progress and experiences of countries in developing and implementing national nutrition plans and policies. The meeting highlighted the fact that the process of developing and strengthening national plans of action has resulted in an increase in various nutrition activities and the prioritizing of nutrition as a key element for national development strategies in various countries.

### Outputs

With support from WHO and other members of the international community, the Region’s ten Member States have developed and begun implementing national food and nutrition policies or plans of action.

FIGURE 6  
**WHO support and status of plans of action in the South-East Asia Region**



### Future action

The Regional review meeting held in December 1999 agreed that the **strategies** enunciated by the ICN were **still very relevant and appropriate** for the countries in South-East Asia Region and each country’s national plan of action should be used as the framework for all nutrition activities to be implemented not only by the country but also by all international and bilateral agencies and nongovernmental organizations. Recognizing the multi-factorial causes of nutritional problems, the meeting also emphasized the importance of the **intersectoral coordinating mechanisms** at all levels, reaching from the community to the central government.

Given the ongoing economic, political, and epidemiological transition in many of the countries in the Region, the strategies and focus (including the implementation process) of national plans of action need to be regularly monitored, analyzed, and evaluated, in order to introduce appropriate modifications, if necessary. Based upon the conclusions and recommendations made at the Regional review meeting, Member States will be **revising and reprioritizing**, where necessary, their national plans of action. The remaining major issue is a successful realization of the national plan of action and its sustainable implementation in each country. **Some key elements** for successful implementation were identified, based on the experiences of some countries. These include:

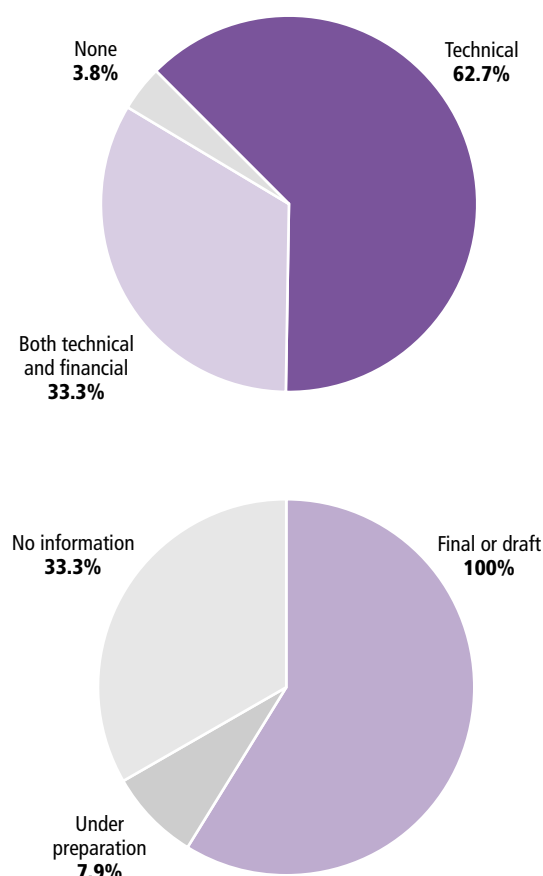
- continuing political commitment of the government;
- a focused approach;
- community-based strategies;
- adapting to social and economic restructuring, and political and economic crises;
- identifying constraints in operational terms as things to be overcome or circumvented;
- maintaining continuity when personnel change at all levels.

#### 4.1.3 European Region

**During 1996–2000**, the WHO European Regional Office provided technical, and in some cases financial, support to 49 of the 51 Member States of the European Region for development and implementation of national food and nutrition policies and plans. Technical support included visits and collaborative work with nutrition focal points in countries by the Regional Nutrition Adviser or nutrition consultants.



FIGURE 7  
**WHO support and status of plans of action in the European Region**



Technical support also included visits and collaborative work with governmental nutrition counterparts nominated by ministries of health. A major technical consultation on the development of a Food and Nutrition Action Plan for the WHO European Region was hosted by the Government of Malta in November 1999.

During the consultation in Malta, national food and nutrition policies and plans were reviewed. Different approaches were identified for accelerating progress in the development and implementation of policies. All but four of the fifty-one Member States of the WHO European Region, together with representatives from UNICEF and FAO, participated in the consultation in Malta.

### Outputs

To date, 30 (59%) of the 51 Member States of the European Region have developed a national food and nutrition plan of action which is now being implemented. Of the remaining 21 Member States, 4 are in the process of developing food and nutrition policies and plans.

### Nutrition policies in Member States of the European Region

Based on country reports prepared for the joint WHO/FAO consultation (Warsaw, 1996) on follow-up to the International Conference on Nutrition (1992), WHO's Regional Office for Europe prepared **a thorough analysis of food and nutrition activities, plans, policies and problems across the region (1)**.

This provided a broad foundation for developing future national policies and plans of action for addressing crucial food and nutrition issues for the Region. These include:

- further development and implementation of national food and nutrition policies;
- food security linked to development of appropriate food-based dietary guidelines;
- promotion and protection of breastfeeding, particularly through the Baby-friendly Hospital Initiative and the International Code of Marketing of Breast-milk Substitutes;
- caring for the deprived and vulnerable;
- micronutrient deficiencies, which are still widespread, particularly iodine, iron, folate, and selenium; and
- appropriate diets and lifestyles, especially concerning obesity, heart disease, and cancer.

### Future action

In the WHO European Region, an initiative is being taken to develop and implement the first Regional Food and Nutrition Action Plan (2000–2005). This will provide a framework to support countries in developing a new approach to address the crucial role that the health sector plays in sustainable development and to develop evidence-based strategies that ensure health is central to all food policies. The Regional Food and Nutrition Action Plan will also promote strategies to reduce levels of noncommunicable diseases, protect health of adults and children, and assist Member States in responding to the many challenges that the new dynamic global food system will impose on the health of all people.

It is planned that the final draft of the Regional Food and Nutrition Action Plan will be submitted to the WHO Regional Committee in September 2000 for its endorsement and adoption.

#### 4.1.4 Western Pacific Region

During 1996–2000 WHO provided technical and/or financial support to *all* 27 Member States in the Western Pacific Region to assist in developing, finalizing, and implementing national food and nutrition policies and plans.

Technical support included visits by the Regional Nutrition Adviser or nutrition consultants, as well as the holding of a major regional meeting in Kuala Lumpur (October 1999). This Regional meeting was convened, in collaboration with the Institute for Medical Research in Malaysia, FAO, and UNICEF, to review progress and experiences of countries in developing and implementing national nutrition plans and policies.

#### Outputs

As a result, thus far **23 (85%) of the 27 countries** in the Western Pacific Region have developed a national food and nutrition policy or plan of action, and many are currently implementing them. An additional 2 countries are in the process of developing their national food and nutrition policies and plans.

#### Future action

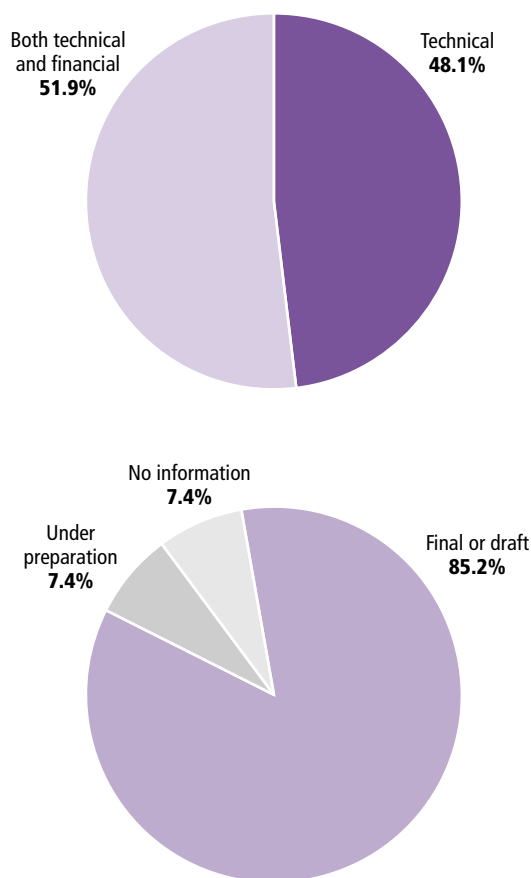
The regional review meeting held in October 1999 identified both constraints and key elements leading to the successful development and implementation of national plans of action. Additional actions and support needed for the preparation, implementation, monitoring and evaluation of national plans of action were also discussed.

Key elements identified for success in developing and translating national plans into action, as well as monitoring and evaluating outcomes, include:

- participation of nutritionists in planning and implementation;
- continued high-level political commitment (especially when a government undergoes restructuring or experiences political, social or economic instability);
- availability of baseline nutrition data and existing nutrition programmes and activities;
- selective and focused approach for implementation (crucial for countries with limited resources);
- consultation with all stakeholders, including local communities;
- official governmental adoption of national plan;

FIGURE 8

#### WHO support and status of plans of action in the Western Pacific Region



- adequate, timely and sustainable budgets, from diverse sources;
- presence of an intersectoral coordinating committee;
- recruitment and assignment of appropriate and well-trained staff;
- designating responsible ministries, departments, or agencies for identified activities; and
- incorporation of monitoring and evaluation components within the national plan of action itself.

Some of the future actions recommended by the meeting were for the Region to:

- hold regular regional policy review and evaluation meetings;
- include national nutrition policies and plans of action on the agenda of various regional meetings organized by regional organizations, including regional offices of WHO, FAO,

UNICEF as well as the Secretariat of the Pacific Community (SPC); and

- strengthen the regional nutrition network.

### Global progress in developing and implementing national nutrition policies and plans of action

Much of the support provided by WHO—the combined activities of the six regional offices and headquarters—is for the development of **national nutrition policies or programmes**. This process was accelerated by the International Conference on Nutrition (1992) and has been sustained by the great interest generated through other major international fora, including the World Food Summit (1996) and the twenty-fifth annual meeting of the ACC Sub-Committee on Nutrition (Oslo, 1998). This activity's true significance lies in Member States' recognition of how essential nutrition is for health and human national development.

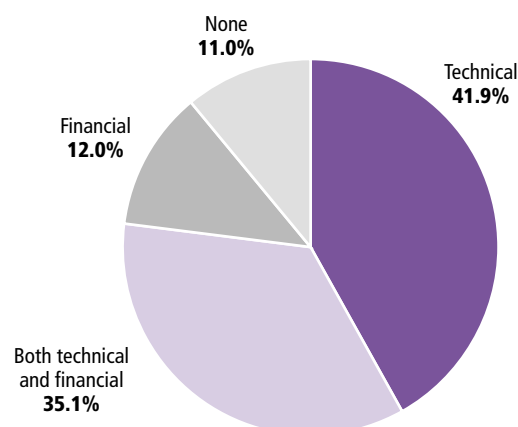
### Progress and outcome

By April 2000, **WHO had provided technical and financial support to 170 of its Member States** specifically for strengthening their national nutrition plans. Through its vigorous regional nutrition programmes, WHO had also organized 28 regional meetings, most often in collaboration with FAO and UNICEF, to assist countries in identifying key factors or successfully improving nutrition, accelerating the reduction of malnutrition, and strengthening national nutrition programmes.

Most regional offices have prepared up-to-date

FIGURE 9

### WHO's cumulative technical and financial support to its 191 Member States for developing national nutrition plans of action



reports providing details of the magnitude of malnutrition (especially protein-energy malnutrition, iodine deficiency, vitamin A deficiency, and obesity) and progress achieved in promoting good nutrition and reducing malnutrition. A joint FAO/WHO report of global progress and action, submitted through the ACC Sub-Committee on Nutrition in March 1997, was forwarded to the United Nations General Assembly through the United Nations Economic and Social Council (ECOSOC).

Thanks to this momentum, by April 2000 a total of 149 countries and 4 territories had finalized or drafted their **national plans of action for nutrition**, and the plans of another 17 countries

TABLE 9

### Progress achieved in developing national plans of action for nutrition

Region	Finalized or draft prepared		Under preparation		Not yet started / no information	
	No. of countries	%	No. of countries	%	No. of countries	%
Africa	43	93.5	3	6.5	0	0
The Americas	31 (+1)*	88.6	4 (+2)	11.4	0 (+13)	0
Eastern Mediterranean	13	59.1	3	13.6	6	27.3
Europe	32	62.7	8	15.7	11	21.6
South-East Asia	9	90	0	0	1	10
Western Pacific	24 (+4)	89	3 (+1)	11	0 (+4)	0
<b>Global</b>	<b>152 (+5)</b>	<b>79.6</b>	<b>21 (+3)</b>	<b>11</b>	<b>18 (+17)</b>	<b>9.4</b>

\*(territories indicated parenthetically)

Source: WHO Global Database on National Nutrition Policies and Programmes (April 1999)

and 3 territories were under preparation. This represents an impressive 91% of WHO's Member States, most of which continue the process of development, implementation and monitoring (Figure 9 and Table 9).

An indication of the priority strategies that Member States recognize and use as key components of their national plans of action for nutrition is based on a recent analysis undertaken using 82 existing national nutrition plans of action from all regions (Table 10).

TABLE 10  
**Priority ICN strategies identified in national food and nutrition plans and policies**

Strategies	%
Incorporating nutritional objectives, considerations and components into development policies and programmes	89
Improving household food security	96
Protecting consumers through improved food quality and safety	92
Preventing and managing infectious diseases	70
Promoting breastfeeding	87
Caring for the socioeconomically deprived and nutritionally vulnerable	92
Preventing and controlling specific micronutrient deficiencies	92
Promoting appropriate diets and healthy lifestyles	89
Assessing, analysing and monitoring nutrition situations	89

Source: WHO Global Database on National Nutrition Policies and Programmes (April 1999)

During the last decade, there have been a number of attempts to set specific goals and targets for eliminating or reducing various kinds of food and nutrition insecurity, including all the major forms of malnutrition. These attempts were undertaken by the 1974 World Food Conference, the United Nations International Development Decade for the 1990s, the 1990 World Summit for Children, the 1992 International Conference on Nutrition and the World Food Summit in 1996.

However, progress towards these targets has been lagging far behind what was intended. Today, malnutrition still underlies almost half the under-five mortality worldwide, in particular in the world's poor and marginalized populations. A continuation of present trends would leave millions of

people undernourished and suffering from all the major forms of malnutrition in the next millennium.

WHO is therefore undertaking a global review and analysis of national nutrition policies and plans of action for re-directing and enhancing its support to countries, and for renewing the political commitment of the international community for achieving food and nutrition security for all. This global review and analysis will examine progress towards developing and implementing national nutrition policies and plans, and key elements for success in translating national policies and plans into operational action.

It will also address some emerging global and regional issues. These will include the impact of global transition on nutrition, the global burden of diet-related diseases, the impact of HIV/AIDS on household food and nutrition security, particularly in Africa, as well as the need for effective and sustainable national food and nutrition policies and plans for the 21st century.

In addition, WHO is holding a series of regional review meetings during 1999–2000 in collaboration with other concerned agencies, such as FAO and UNICEF. The review meetings for the European Region, South-East Asia Region and Western Pacific Region were held in 1999, as indicated in the previous sections. The regional review meeting for Francophone countries in the African Region is scheduled for June 2000, that for Anglophone countries in the African Region in August 2000, for the Region of the Americas in April 2000, and for the Eastern Mediterranean Region in October 2000.

#### 4.1.6 Preparation of training modules

WHO, in close collaboration with its Regional Office for Europe and the Thames Valley University, is preparing **training modules** for developing effective and sustainable national nutrition policies and plans. These modules take into account the increasing "nutrition transition" which many countries are experiencing, and its impact on household food and nutrition security. The first field-testing of these training modules was conducted in Moscow in 1997 and their further field-testing with the south-eastern European countries is being planned in Slovenia in June 2000, and with the Baltic countries in Latvia in August 2000. It is envisaged that the draft training modules will be adapted initially for the Asian regions where they will be field-tested in late 2000 or early 2001.

## 4.2 Management of severe malnutrition

Malnutrition remains **one of the most common causes of morbidity and mortality among children** around the world. Approximately 9% of children below the age of five in developing countries suffer from wasting, weight-for-height below -2 standard deviations (SD) of the NCHS/WHO reference values. These children are at risk of death or severely impaired growth and psychological development.

**Studies** carried out during emergency and non-emergency situations have demonstrated the association between increased mortality and the increasing severity of anthropometric deficits. For example, data from six longitudinal studies on the association between anthropometric status and mortality of children aged 6-59 months showed a strong log-linear or exponential association between the severity of weight-for-age deficits and mortality rates. Indeed, out of the 10.4 million deaths among under-five children in 1995 in developing countries, it is estimated that 5.1 million—or 49% of all young-child mortality—were associated with malnutrition. It is significant that the majority of these cases were due to the potentiating effect of mild-to-moderate rather than to severe malnutrition.

**Widespread faulty practices** in hospitals and health centres in the management of moderate and severe malnutrition comprise one of the main reasons for continued high mortality from protein-energy malnutrition underweight (low weight-for-age). Despite a decline in the global prevalence of underweight—from 37.4% in 1980 to 26.7% in 1999—associated with improved primary health care and community awareness, there has been little improvement in the survival of children with severe malnutrition. In fact, in many centres, the case fatality is above 30%, yet in others, where improved management techniques are practised, mortality levels from severe malnutrition are less than 5%.

However, there have been **many advances** in the treatment of severe malnutrition since 1981, when WHO published its manual on the treatment and management of severe PEM. For example, improvements in both **oral rehydration salt (ORS)** solution for treating dehydration and dietary management in the initial treatment phase reflect the advances and knowledge that have been made in the **physiological role of micronutrients**. Moreover, the importance of **physical and psychological stimulation**, together with care and affection, has been increasingly recognized and

demonstrated to prevent retardation in growth and psychological development during the rehabilitation phase.

An **updated manual (2)** has been developed over the last five years, with contributions from over 30 scientists and clinicians and support from UNHCR and the International Dietary Energy Consultative Group (IDECG). Field-testing was carried out in Bangladesh, Brazil, India, and Viet Nam. The Department of Nutrition for Health and Development has contributed to and coordinated the writing of this manual, which provides guidelines for assessment, resuscitation, management, and rehabilitation of severely malnourished children. The manual is intended for health personnel working at central and district levels, including physicians, nurses, midwives, and auxiliaries.

The importance of treating severe malnutrition as **both a medical and social disorder** is emphasized. As successful management does not require sophisticated facilities and equipment or highly qualified personnel, the manual also performs a persuasive function; that is, it encourages health professionals to do all they can to save these children and meet their needs for care and affection. Recommended procedures draw on extensive practical experience and recent therapeutic advances as described above. These include improved solutions of oral rehydration salts for treatment of dehydration, better understanding of the role of micronutrients in dietary management, and growing evidence that physical and psychological stimulation can help prevent long-term consequences of impaired growth and psychological development.

The **principles of management** during three phases are introduced: initial treatment, rehabilitation, and follow-up. Chapter two briefly discusses treatment facilities; chapter three provides advice on how to assess nutritional status, take medical history and conduct a physical examination. Some useful laboratory tests are listed, though the book stresses that such tests are not needed to guide or monitor treatment. The most extensive chapter gives guidelines for initial treatment. Subsequent chapters provide guidelines for rehabilitation, including emotional and physical stimulation as well as feeding, and follow-up. The manual concludes with brief advice on management of severely malnourished children in disaster situations and refugee camps, and of severely malnourished adolescents and adults.

**Training materials in the management of severe malnutrition** are presently being developed to accompany and support this updated



manual. Field testing of the package is scheduled for December 2000 in Nepal.

## 4.3 Control of micronutrient malnutrition

### 4.3.1 Elimination of iodine deficiency disorders (IDD)

#### Support for national IDD programmes

As the result of an extremely effective partnership with UNICEF and ICCIDD, WHO continues to provide technical support, at country and regional levels, to governments and other agencies for the establishment of national iodized salt programmes. Of note in this effort is the key role played by NGOs and the salt industry.

In 1999, 68% of households worldwide had access to iodized salt. According to WHO region, the percentages were:

● Africa	63%
● Americas	90%
● South-East Asia	70%
● Eastern Mediterranean	66%
● Europe	27%
● Western Pacific	76%

**African Region.** Virtually every country in Africa has some degree of IDD problem. Twenty-two countries now report that at least 50% of households consume iodized salt, compared to about 63% of households in the Region overall. The greatest progress has occurred where there are relatively few large-scale producers or importers, as for example in Cameroon, Namibia, Nigeria, and Zimbabwe. In **ten countries**—Algeria, Botswana, Cameroon, Democratic Republic of Congo, Kenya, Nigeria, Madagascar, Swaziland, Zambia, and Zimbabwe—sentinel-site monitoring has consistently reported median urinary iodine values above 100 µg/l, reflecting a dramatic improvement in iodine status.

During 1998–1999, WHO:

- organized two intercountry workshops on micronutrient deficiency for programme managers in Mbabane, Swaziland and in Abidjan, Côte d'Ivoire;
- held the annual meeting of the African Task Force for Micronutrient Control in Mombassa, Kenya; and
- co-sponsored an intercountry workshop for salt producers in Mombassa, Kenya.

**The Americas.** IDD is endemic in many Latin American countries, but of all WHO regions the Americas are the closest to eliminating it. Of the 19 countries with a significant IDD problem in 1990, all have made substantial progress, and ten countries, including Brazil and Mexico, now report more than 90% of households consuming iodized salt. Overall, 90% of the total population of the affected countries now have access to iodized salt, and nearly all countries have established monitoring systems.

Urinary iodine data from national surveys, or from studies in several formerly high-risk areas, show that **median levels are now consistently above 100 µg/l** in Bolivia, Chile, Colombia, Ecuador, Guatemala, Mexico, Panama, Peru, and Uruguay.

During 1998–1999, WHO:

- participated in the assessment of the IDD control programme in Peru, and
- co-sponsored an intercountry workshop for salt producers in Bogota, Colombia.

**South-East Asia Region.** Iodine deficiency is **widespread** in much of the South-East Asia Region with Total Goitre Rate (TGR) prevalences ranging from 4.3% to 49%. With a total population of nearly 1500 million, the resulting burden of morbidity is enormous. All ten countries in this Region now have active salt iodization programmes, apart from the Democratic People's Republic of Korea where IDD is likely to be fairly mild. While only Nepal has achieved greater than 90% household consumption of iodized salt, the level of coverage in the Region as a whole is about 70%.

In Bhutan a random survey found TGR at 14%, a substantial drop from the 60% recorded in 1983. Similarly, Thailand saw its TGR drop from 9.3% to 4.3% between 1989 and 1996. Post-iodization data from Bhutan and some states of India show **median urinary iodine levels well above 100 µg/l**.

During 1998–1999, WHO:

- participated in the setting up of the South East Asia IDD Elimination Action Group.

**Eastern Mediterranean Region.** IDD affects a **broad swath of North Africa and the Middle East**, and is particularly severe in the Islamic Republic of Iran, Iraq, Pakistan, Sudan, and Syria. All affected countries now have control programmes. Of the 17 countries known to be affected by IDD, 14 now have legislation and 9 now report more than 50% of households consuming iodized salt;

in three of these—Iran, Lebanon and Tunisia—coverage is greater than 90%.

Only two countries—the Islamic Republic of Iran and Saudi Arabia—report median urinary iodine levels above 100 µg/l. However, 10 countries have laboratory facilities to monitor urinary iodine, and 14 countries have established a system to monitor salt iodization.

**European Region.** Thirty-two countries in the European Region are affected by IDD, mostly **in Eastern and Southern Europe**. During the later part of the 1990s, good progress was made towards the elimination of IDD in several countries in Eastern European—notably the Czech Republic, Hungary and Poland.

Legislation is now planned or already in place in 32 countries. In many, however, enforcement is weak and monitoring ineffective. Several countries still continue to require that potassium iodide, rather than the more stable iodate, be added to salt. Good data are frequently lacking, but it is known that the consumption of iodized salt remains low in the Russian Federation, Ukraine and many countries in Central Asia.

**Western Pacific Region.** There are **nine countries** in the Western Pacific Region with a significant IDD problem: Cambodia, China, Fiji, Lao People's Democratic Republic, Malaysia, Mongolia, Papua New Guinea, Philippines and Viet Nam. **China** alone, with a population of about 1250 million, accounts for a very substantial part of the total world burden of IDD. IDD control programmes are now well established throughout the affected countries except in Papua New Guinea and Fiji, where they are still being developed.

Currently around 76% of households throughout the affected countries of the Region consume iodized salt except China, where the figure is over 90% of households. Three countries now have median urinary iodine levels above 100 µg/l—China, Mongolia, and Papua New Guinea. In China, median levels are above 100 µg/l in all provinces except Tibet.

### WHO's normative role

Over the last five years, NHD concentrated on a **number of crucial scientific issues** for implementing national IDD prevention and control programmes. These include:

- development and dissemination of revised levels for safe iodization (3) following the conclusion of a seven-country study by WHO, UNICEF and ICCIDD to assess the impact of

salt iodization on iodine status of the population (4);

- research and publication on the safe use of iodized oil to prevent IDD in pregnant women that led to a statement by WHO (5);
- standardization of methods for assessing IDD including development of reference values for thyroid volume in children aged 6–15 years (6);
- global review of the IDD situation and progress made towards its elimination (7);
- updating of the indicators recommended for assessing IDD and its control through salt iodization;
- updating of the WHO Global Database on IDD; and
- collaboration with the World Trade Organization on salt trade across countries.

### 4.3.2 Elimination of vitamin A deficiency (VAD)

#### Support for national VAD prevention and control programmes

**At both the country and regional levels**, WHO has provided technical support to governments and agencies for the establishment of national VAD prevention and control programmes. This has often been in collaboration with UNICEF, the Micronutrient Initiative (MI), and at times with the International Vitamin A Consultative Group (IVACG). The goal is elimination of vitamin A deficiency as a public health problem country by country and ultimately worldwide.

**African Region.** VAD is a public health problem in 44 countries in the Region. Through the project funded by the Micronutrient Initiative on vitamin A supplementation through immunization, WHO supported 13 countries in providing vitamin A supplements during national immunization days (NID). It is planned during the coming years to reinforce vitamin A supplementation using routine immunization, and not only special campaigns.

**South-East Asia Region.** The available evidence indicates that in the Region severe forms of VAD have declined, although in most countries VAD continues as a public health problem. As many as 125 million children are currently at risk of VAD. Xerophthalmia is seen in nearly 1.3 million children.

The countries in the Region have launched short-term VAD prevention programmes, such as supplementation with vitamin A capsules through NID (India). However, a more sustainable solution would be to encourage dietary diversification and ensure higher dietary intake of vitamin A-rich foods.

**Eastern Mediterranean Region.** Vitamin A deficiency is a public health problem in six countries: Djibouti, Iraq, Pakistan, Somalia, Sudan, and Yemen. Subclinical VAD in young children and pregnant women is a problem in a substantial number of countries in the Region, while only a few countries have experienced a clinical manifestation of the deficiency.

In affected countries, efforts continue to improve the dietary intake of vitamin A and its precursors, and distribute high-dose vitamin A supplements as part of the national immunization days. Some have included supplementation in immunization. Oman has established a national vitamin A control programme, which includes distribution of vitamin A capsules to young children and to women who have just delivered. Oman is also studying the feasibility of fortifying oil with vitamin A. Other countries, such as Jordan and Syria, have embarked on surveys to assess the level of vitamin A deficiency.

### WHO's normative role

Over the last five years, NHD undertook the following normative work concerning vitamin A:

- recommendations on safe dosage of vitamin A during pregnancy and lactation for which an expert consultation was convened in June 1996 (8);
- revised dose schedules for vitamin A supplements (9);
- development of a strategy for the acceleration of progress in combating VAD in collaboration with UNICEF, MI, the World Bank, CIDA and USAID (10);
- guidelines to integrate vitamin A supplementation with immunization activities (11); and
- revision and update of the WHO Global Database on VAD.

In addition, NHD co-sponsored several meetings, usually in collaboration with UNICEF, to revisit VAD control strategies with additional emphasis on:

- strategies to accelerate VAD control;

- the health impact of VAD on pregnant women and their offspring, in terms of mortality;
- vitamin A supplements and immunization, in particular national immunization days; and
- vitamin A supplements in young children.

### 4.3.3 Reduction of iron deficiency and anaemia (IDA)

#### Support for national IDA programmes

Iron deficiency and anaemia (IDA) is a public health problem in **most countries of the world** but especially those in **Africa and Asia**. And in spite of the importance of the problem, IDA control programmes have had limited impact. One reason for this is that iron deficiency has not been considered in the wider perspective of anaemia and its multiple determinants. WHO policy aims to identify these determinants as the basis for an integrated approach by the main programmes involved, in particular, nutrition, child health, safe motherhood, parasitic disease, malaria, and sanitation.

**South-East Asia Region.** An alarming 600 million people in the Region suffer from IDA. It predominantly affects adolescent girls, women of reproductive age, and young children. The condition has an overall prevalence rate of 74% among pregnant women, ranging from 13.4% in Thailand to 87% in India. ID&A is one of the major causes of **maternal mortality and morbidity**.

Apart from inadequate intake, poor **bioavailability of iron**, from cereal-based diets and high rates of intestinal worm infection, is considered the main factor responsible for IDA. The main reasons for the lack of reduction in its prevalence are that the condition often remains undetected unless it is severe, and that most of the countries in the Region do not have national IDA control programmes. Interventions being implemented in some countries have failed to have the desired impact because of inadequate supply, inadequate coverage, poor compliance rate, lack of community involvement, and low priority in national policies.

**Intestinal worm infections** are common in all countries in the Region and six countries have a prevalence between 46% and 90%. Several countries have now initiated an integrated and more comprehensive approach to anaemia control, which includes provision for deworming, iron and folate supplements for pregnant women, nutrition education in iron-rich foods, and health education in personal hygiene and sanitation.



**Eastern Mediterranean Region.** Oman and Saudi Arabia are now **fortifying wheat flour with iron, folate, and other micronutrients**, while Bahrain conducted a needs assessment survey, followed by a decision to start fortification. The Regional Office for the Eastern Mediterranean, together with the Micronutrient Initiative (MI) and UNICEF, conducted a series of fact-finding missions and organized a joint workshop (WHO/UNICEF/MI/ILSI) on “Fortification of Flour for Control of Micronutrient Deficiencies in the Eastern Mediterranean, Middle East, and North Africa” in (1998). Progress was reviewed, obstacles identified, and countries developed strategies and action plans for accelerating flour fortification.

**European Region.** Anaemia is an important public health problem in Europe. In order to address the problem and examine strategies to control anaemia and iron deficiency, an intercountry workshop was organized jointly by WHO, UNICEF, and the Micronutrient Initiative in 1999.

### WHO’s normative role

NHD has attended and co-sponsored several meetings, most of them in collaboration with UNICEF, UNU, and INACG, in consideration of the following issues:

- use of iron supplements to prevent and treat iron deficiency and anaemia (12),
- indicators for assessing iron deficiency and anaemia (13),
- strengthening the WHO Global database on IDA;
- safety of iron supplements in malaria endemic areas; and
- strategy for IDA prevention.

#### 4.3.4 Folate deficiency

The last WHO review on folic acid requirements was prepared jointly with FAO in 1988. Since then, **much new evidence has accumulated**, indicating that folate deficiency is not only associated with macrocytic megaloblastic anaemia—which is especially widespread in pregnant women—but also with the following conditions:

- neural tube defects in high-risk population groups;
- elevated plasma homocysteine levels, and thus increased risk of coronary heart disease and stroke; and

- various cancers, particularly of the colon.

In the light of these concerns, NHD commissioned a **review of the most recent scientific data on folate deficiency** for presentation to the WHO Expert Committee on the Use of Essential Drugs (1997). The Committee endorsed one of the review’s main findings, i.e., an increase of the folate content in the iron/folate tablet from 250 mg to 400 mg, which translates into a more appropriately dosed iron/folate tablet (60 mg Fe/400 mg folate) for supplementing women of childbearing age.

## 4.4 Prevention and management of obesity

Until recently **obesity had been largely ignored** in national and international health strategies. This is partly due to the fact that obesity was not recognised as a disease.

However, WHO’s first expert consultation on obesity in Geneva (1997)(14) emphasized that overweight and obesity represent a rapidly growing threat to the health of populations worldwide. Obesity was recognized as a disease in its own right and should now be regarded as one of the most neglected contemporary public health problems.

The report (15) of the consultation provides a comprehensive overview of the global prevalence and trends of obesity and related health and economic costs; factors affecting the development of obesity; and principles and approaches for preventing and managing obesity. In 1998, as part of its efforts to foster the **development of global and national strategies for preventing and managing obesity**, WHO organized a technical consultation on behavioural and socio-cultural aspects of preventing obesity and its associated problems in Tokyo (1998) (16).

The aims of the consultation were threefold: to review and analyse emerging trends of nutrition transition and various behavioural factors contributing to the development of overweight and obesity; to review country experiences in promoting healthy diets and lifestyles, especially with respect to obesity prevention; and to develop guidelines for improving obesity prevention strategies.

The consultation developed a framework from which multisectoral strategies could be developed for reducing an obesity-promoting environment and addressing behavioural change. As the next step for developing strategies for preventing and controlling obesity, WHO is organizing a series of regional meetings to review the regional situation, examine contributing factors which promote an

obesogenic environment, examine health and economic implications, and develop regional strategies and a framework for developing national strategies using a holistic environmental approach.

The first regional meeting was held in Bahrain in November 1999 for countries in the Eastern Mediterranean Region. The next regional meeting is being planned for the Pacific countries in September 2000.

Furthermore, to contribute to the development of effective global strategies, various scientific and technical reviews and analyses have been undertaken for the:

- review and analysis of obesity and gender in collaboration with the National Institute of Public Health and Environment in the Netherlands, as well as with the Evidence and Information for Policy (EIP) cluster in WHO;
- review and analysis of obesity and development;
- review of regional dietary guidelines;
- review of definitions and risks of overweight and obesity; and
- review and updating of the technical report on diet, nutrition, and the prevention of chronic diseases, in collaboration with FAO and various expert working groups, as well as with the Noncommunicable Diseases and Mental Health (NMH) cluster in WHO.

In addition, an advocacy booklet on obesity is being produced in order to disseminate information and sensitize policy-makers, partners, donors, related medical professionals, concerned industries, and possibly the general public.

### Impact of rapid global transitions on obesity

Currently, a review and analysis of the impact of rapid global transitions is under way. Under consideration are shifts in income, lifestyles, diet, patterns of agriculture and trade, food policy, physical activities, occupational patterns, and shifts from rural to urban settlement, as each of these factors affects the increasing public health problem of obesity. The aim of this work is to identify possible behavioural and environmental indicators which may provide a picture of this on-going nutrition transition and contribute to developing global strategies for preventing and controlling obesity. The undertaking of this enormous review and analysis is being implemented in collaboration with the University of Auckland (New Zealand).

### Economic cost of overweight and obesity

Efforts are also being made to review and analyse the economic impact of overweight and obesity worldwide, in collaboration with the University of Sydney (Australia) as well as with the Evidence and Information for Policy (EIP) cluster. To date, there have been only a few attempts to quantify the economic burden of obesity-related morbidity and mortality.

However, the limited data available suggest that anywhere between 2% and 7% of a country's total health care expenditure may be directly attributable to overweight and/or obesity. This review and analysis should contribute to overall policy and strategy development for preventing a global obesity epidemic.

## 4.5 Promoting sound infant and young child feeding practices

### 4.5.1 The Baby-friendly Hospital Initiative

The joint WHO/UNICEF Baby-friendly Hospital Initiative (BFHI), which was launched in 1992, is now **operating in 171 countries**. The number of 'baby-friendly' hospitals rose from about 4300 in 1995 to more than 12 000 by the end of 1997, and to more than 16 000 by the end of 1999.

The Baby-friendly Hospital Initiative is **the primary intervention strategy** that Member States and WHO are using to strengthen the capacity of national health systems to protect and promote breastfeeding. WHO's approach includes advocacy, information dissemination, and capacity building through the production of training materials. Emphasis is on developing core groups of trainers at national and regional levels, training national programme assessors, developing reassessment and monitoring tools to ensure the Initiative's sustained integrity and credibility, and broadening it to include a mother-and-baby-friendly focus.

One of the operational targets of the Innocenti Declaration (17) is to ensure that every facility providing maternity services fully practises all of **the Ten Steps to Successful Breastfeeding** (18). In assessing the progress of countries towards meeting the operational targets of the Innocenti Declaration, NHD recently collected the following information.

### Breastfeeding policy

Twenty-one of 31 countries in the African Region, 22 of 25 countries in the Region of the Americas,

14 of 17 countries in the Eastern Mediterranean Region, and 21 of 35 countries in the European Region have a **written breastfeeding policy**.

### Baby-friendly hospitals

These four WHO regions have a total of 14 751 **hospitals offering maternity services**. By the end of 1997, 2518 had been designated 'baby-friendly' compared to 943 hospitals at the end of 1995. Another 4400 hospitals were targeted to become baby-friendly (1554 hospitals in the African Region, 1294 in the Region of the Americas, 772 in the Eastern Mediterranean Region, and 780 in the European Region).

### Baby-friendly Hospital Initiative committees

In the same four regions, 67% of Member States have a **BFHI committee** and 71% have a **plan of action** for implementing BFHI. A total of 1824 hospitals in the four regions have certificates of commitment (480 in the African Region, 938 in the Region of the Americas, 352 in the Eastern Mediterranean Region, and 54 in the European Region).

### Free and low-cost supplies of breast-milk substitutes

The distribution of free and low-cost breast-milk substitutes has **ended** in 6024 hospitals (1967 in the African Region, 1519 in the Region of the Americas, 704 in the Eastern Mediterranean Region and 1834 in the European Region). Training for health workers and hospital personnel, with a focus on district-level expertise to promote breastfeeding through the BFHI, is a key component of WHO's 'integrated management of childhood illness' approach. The Department of Child and Adolescent Health has thus developed, in collaboration with UNICEF, a 40-hour course for health workers (19).

#### 4.5.2 Breastfeeding promotion: gaining support of policy-makers and hospital administrators

NHD has also developed an **innovative teaching resource**. This course comprises a collection of eight modules, complete with slides and handouts, to help administrators and policy-makers promote breastfeeding in health facilities. The course (20), which was developed in collaboration with

TABLE 11

**The Baby-friendly Hospital Initiative: a regional survey overview, 1998**

Regions	Hospitals with maternity services	Hospitals targeted baby-friendly	Hospitals designated baby-friendly	Hospitals having certificate of commitment	Hospitals that have ended distribution of free/low-cost supplies of breast-milk substitutes
Africa	7285	1554	638	40	1967
The Americas	2231	1294	981	938	1519
Eastern Mediterranean	1202	772	677	352	704
Europe	4033	780	222	54	183

TABLE 12

**The Innocenti Declaration: a regional survey overview on progress and achievements, 1998**

Regions	National breast-feeding committees (%)	Nongovernmental organizations working on breastfeeding (%)	National breast-feeding policy (%)	National plan of action (%)	Adoption of the International Code (%)	Adoption of maternity protection legislation (%)
Africa	58	74	68	84	61	87
The Americas	88	80	88	72	80	100
Eastern Mediterranean	65	53	82	71	53	94
Europe	80	71	60	57	49	89

Wellstart International, a WHO collaborating centre, aims to increase awareness among decision-makers in hospitals and maternity wards of specific policy and administrative changes that can have a positive impact on breastfeeding practices. It also provides abundant practical advice on how to introduce changes in a given setting.

Changes in hospital practice require that **key personnel**, including directors of facilities, are sensitized both to the need for change and how to introduce it. Existing BFHI training courses have a different focus. In addition, existing courses are generally longer and more detailed than the time that most key hospital administrators and policy-makers have available to devote to training. By contrast, this new short course is meant to fill this gap. It provides practical guidance on the policy and administrative changes needed to put appropriate procedures in place.

NHD has participated in **introducing the course** in Ghana, Kenya, Lithuania, Malaysia, Spain, Saudi Arabia, Swaziland, Ukraine, USA, and the United Kingdom. It has had a positive impact on BFHI status and progress, and consequently on breastfeeding practices and prevalence.

In Ukraine, for example, **the course has been repeated twenty times** and prompted the establishment of a national breastfeeding committee and the development of a formal breastfeeding policy. In Brazil, where the course will be integrated into the overall national training plan for breastfeeding, it is used to sensitize decision-makers and obtain their commitment to making hospitals baby-friendly.

To support national efforts to maintain the Initiative's credibility and sustainability, NHD has developed **reassessment and monitoring tools** based on the WHO/UNICEF BFHI Global Criteria. These can be used for collecting data and gathering statistics on key indicators related to BFHI and infant feeding practices. NHD also provides technical support to countries for the development, implementation and follow-up of overall training plans, and in monitoring the impact of training on breastfeeding prevalence and duration.

### The Baby-friendly Hospital Initiative: monitoring and reassessment—tools to sustain progress

With the steady increase of hospitals worldwide that have been designated 'baby-friendly', health authorities in many countries have expressed a **need for monitoring and reassessment tools** that will help them build on progress achieved through the Baby-friendly Hospital Initiative. NHD

has published reassessment and monitoring tools based on the WHO/UNICEF BFHI Global Criteria. The monitoring tool can be used for collecting data and gathering statistics on key indicators related to BFHI and infant feeding practices.

These tools were **field-tested** in Brazil, Egypt, Nicaragua, and Poland, in close collaboration with Wellstart International and UNICEF for CEE/CIS/Baltic States' Office. The tools are designed to foster involvement of both hospital management and staff in identifying and solving problems, and in implementing the Ten Steps to Successful Breastfeeding. Their application should contribute to the Initiative's long-term credibility and sustainability.

### 4.5.3 The Innocenti Declaration: reaching the targets

**The Innocenti Declaration** (1990) included four specific operational targets (see below) and called on international organizations to formulate global action strategies to protect, promote and support breastfeeding, and to monitor and evaluate their implementation. In 1991 the World Health Assembly welcomed the Declaration as a basis for international health policy and action and requested the Director-General to monitor achievements in this connection (resolution WHA44.3).

Using a questionnaire in 1998, NHD evaluated steps taken in Member States to achieve the Declaration's operational targets. Responses were received from 67% of Member States in the African Region, 74% in the Region of the Americas, 77% in the Eastern Mediterranean Region, and 69% in the European Region, for a total of 57% (108) of WHO's 191 Member States.

The four specific operational targets of the Innocenti Declaration involved:

**Target 1: Breastfeeding committees.** A large proportion of countries have breastfeeding committees (58% in AFR, 88% in AMR, 65% in EMR, and 80% in EUR) and nongovernmental organizations working in breastfeeding promotion (74% in AFR, 80% in AMR, 53% in EMR, and 71% in EUR). Breastfeeding committees are composed of representatives from relevant government departments, nongovernmental organizations, educational institutions, health professional associations, and infant-food manufacturers.

**Target 2: Breastfeeding policy.** Sixty-eight percent (AFR), 88% (AMR), 82% (EMR), and 60% (EUR) of Member States have formulated national breastfeeding policies. Eighty-eight percent (AFR), 72% (AMR), 71% (EMR) and 57%



(EUR) have plans of action for implementing the BFHI.

**Target 3: The International Code of Marketing of Breast-milk Substitutes.** The governments of many Member States have also adopted the International Code (61% in AFR, 80% in AMR, 53% in EMR, and 49% in EUR) and are monitoring its application. Nevertheless, some are only in the preliminary stages of drafting national measures for this purpose, while still others have hardly begun.

**Target 4: Maternity legislation.** Governments are using a variety of approaches to protect, promote and support breastfeeding by enacting imaginative maternity protection legislation (87% in AFR, 100% in AMR, 94% in EMR and 89% in EUR). They are also providing information on breastfeeding through the mass media, e.g. television and radio programmes, newspaper articles, and national breastfeeding weeks.

The consolidated survey results (21) provide a useful basis for assessing progress made towards achieving the Innocenti Declaration operational targets and identifying areas where more effort is needed. It is planned to repeat this exercise every three years, and the information collected will be included in relevant reports by the Director-General to the World Health Assembly. To facilitate this process, NHD has added a module on Innocenti targets to the WHO Global Breastfeeding Data Bank (see Section 7).

A revised questionnaire on Innocenti targets will be sent to Member States soon, to collect data and consolidate information to be reported at the 55th World Health Assembly reporting year on infant and young child feeding.

#### 4.5.4 HIV and infant feeding

Since the beginning of the AIDS pandemic, an estimated three million children worldwide have been infected with HIV, the virus that causes AIDS. **Mother-to-child transmission** of the virus is responsible for more than 90% of cases, of which two-thirds are believed to occur during pregnancy and delivery and about one-third through breastfeeding.

As the numbers of women of childbearing age infected with HIV rises, so too does the number of infected children. In 1997 alone, more than half a million children were infected. HIV is now the single most important cause of child death in a growing number of countries.

WHO, UNICEF, and UNAIDS issued a **joint policy statement on HIV and infant feeding**

in 1997. Subsequently, NHD developed a set of **three manuals** offering the latest expert advice on recommended safe practices for infant feeding when a mother is infected with HIV.

These documents, at present being translated into French, Russian, and Spanish, are entitled:

- HIV and infant feeding: guidelines for decision-makers (22);
- HIV and infant feeding: a guide for health care managers and supervisors (23); and
- HIV and infant feeding, a review of HIV transmission through breastfeeding (24).

These documents were developed in close collaboration with the HIV subgroup of WHO's **Technical Working Group on Breastfeeding**. Participating organizations include the Division of Child Health and Development, the Human Reproduction Programme, the Division of Reproductive Health, the Office of HIV/AIDS and Sexually Transmitted Diseases, and UNICEF and UNAIDS.

In collaboration with UNAIDS and UNICEF, WHO organized a technical consultation on **HIV and infant feeding** in Geneva (1998). Participants included technical experts and representatives both from national maternal and child health and AIDS programmes, and from relevant international and nongovernmental organizations (25).

The consultation's **key recommendation** was that access to alternatives to breastfeeding should be improved for HIV-positive women. Participants also endorsed the need to implement measures to prevent breastfeeding from being undermined among HIV-negative women and among women whose HIV status is unknown. There was consensus that methods for procuring, distributing and making available replacements for breast milk should comply fully with the principles and aim of the International Code of Marketing of Breast-milk Substitutes and subsequent resolutions of the World Health Assembly.

**Strengthening health care services**, particularly reproductive health services, was also identified as a priority in developing countries in implementing interventions. These interventions are designed to reduce HIV infection in women, reduce mother-to-child transmission of HIV, and ensure care and support for HIV-positive mothers.

WHO is taking the lead in conducting further research to examine the impact of feeding mode (exclusive breastfeeding vs. mixed breast- and artificial feeding) on the rate of HIV transmission. WHO and UNICEF are jointly developing a counselling course on HIV and infant feeding.

#### 4.5.5 A new global strategy and plan of action for infant and young child feeding

**Technical consultation on infant and young child feeding.** As one step in identifying the Organization's future priorities and accelerating progress in Member States, WHO convened, in collaboration with UNICEF, a technical consultation on infant and young child feeding (Geneva, 13–17 March 2000) (26). Two decades after the first international meeting on the subject (27), the objectives of the consultation were to:

- assess the strengths and weaknesses of current feeding policies and practices;
- identify barriers to policy implementation;
- review key interventions as a first step to identifying feasible and effective ways forward; and
- contribute to the development of a comprehensive draft strategy that, when adopted, will guide Member States and the international community in the years to come.

Over the last two decades WHO and its international partners have promoted universal implementation of a number of key approaches. For example, the Baby-friendly Hospital Initiative and the International Code of Marketing of Breast-milk Substitutes have not only succeeded as frameworks for ensuring that both health services and marketing practices contribute to good nutrition; they have also effectively raised awareness of the specific nutritional needs of the very young and how these needs should be met.

Despite the real progress achieved in the last two decades, WHO recognizes that much more needs to be done, nationally and internationally, to encourage appropriate feeding practices for infants and young children. Priority actions include:

- promoting *exclusive* breastfeeding during the first months of life (only an estimated 35% of infants are exclusively breastfed between 0 and 4 months of age);
- ensuring timely, appropriate and safe complementary feeding while breastfeeding continues (frequently, other foods are introduced too early or too late and infants are weaned too early);
- reinforcing policies that support breastfeeding by working women (including by increasing the proportion of women covered by ILO standards and other measures);
- taking steps to prevent premature interruption of exclusive breastfeeding and, as appropriate, to avoid artificial feeding from becoming the norm or to reverse the decline

in breastfeeding prevalence and duration (including by promoting appropriate marketing of infant foods, minimizing the negative impact of globalization on feeding patterns, and improving public education and health worker training); and

- dealing successfully with the threat to healthy nutrition posed by difficult circumstances such as HIV/AIDS and major emergencies (meeting these children's nutritional needs in ways that are appropriate to their specific circumstances).

Discussion themes included improving breastfeeding and complementary feeding practices, strengthening the Baby-friendly Hospital Initiative, supporting breastfeeding women, and reinforcing implementation of the International Code of Marketing of Breast-milk Substitutes. A number of cross-cutting issues are important to nearly all discussion themes, for example HIV and infant feeding, women's health, micronutrient malnutrition, growth and development, and feeding during emergencies.

#### Laying the foundation

As a result of this preparatory and consultative process, a draft strategy and plan of action are now being prepared for critical review by Member States and other interested parties (see below); they will identify priorities, action areas and operational targets—for governments, international organizations and civil society—to improve the feeding of infants and young children. The strategy currently has three main objectives:

- to improve infant and child survival, health, nutritional status, and growth and development through optimal feeding. Ensuring the survival, health and nutritional status of women in their own right, and in the context of their role as mothers, are fundamental to attaining this objective;
- to guide government policy and action—and related support provided by the international community—for protecting, promoting and supporting optimal feeding practices for infants and young children; and
- to enable mothers, families and caregivers in all circumstances to make—and carry out effectively—informed choices about optimal feeding practices for infants and young children.

Building on past achievements, the draft strategy will reaffirm commitment to existing action platforms, including attainment of the operational

targets of the Innocenti Declaration (28), implementation of the Baby-friendly Hospital Initiative and achievement of the aim of the International Code of Marketing of Breast-milk Substitutes. The draft strategy will also call for particular emphasis to be placed on three priority areas.

**1. Exclusive breastfeeding.** Existing initiatives need to be strengthened, and new approaches developed, to protect, promote and support exclusive breastfeeding (29). The dual challenge for governments is to play a strong advocacy role and to enact policies and develop programmes that reinforce family and community support for breastfeeding mothers, including that provided by mother-to-mother support groups the world over. It also means ensuring that “baby-friendly” principles are applied *wherever* mothers give birth, and that the Initiative’s high standards are maintained through careful monitoring; promoting adoption of effective measures, including legislation, to give effect to the International Code of Marketing of Breast-milk Substitutes; and protecting the maternity—including the breastfeeding—rights of women in the workplace.

**2. Complementary feeding.** Timely, safe and adequate complementary feeding, with continued breastfeeding, needs to be accorded priority status on the global nutrition agenda. Indeed, the continued high levels of growth faltering in many parts of the world suggest that complementary feeding practices remain inadequate for substantial numbers of children. More needs to be done to improve feeding practices based on locally available and affordable foods, to develop guidelines and indicators of appropriate nutritional outcomes, and to expand the content and availability of objective and consistent informational and educational materials for health workers, mothers and families. Action-oriented research is also needed to identify causes and remedies for growth faltering.

**3. Feeding in difficult circumstances.** Tragically, caring for populations during emergencies remains a major global humanitarian priority. The best hope for averting the disability and death that are so common among infants and young children in such circumstances is to ensure that they are adequately cared for and fed. However, meeting the nutritional needs of infants and young children during emergencies (e.g. natural disasters, famine, civil unrest, and refugee settings); in the presence of HIV/AIDS; and when they are already severely malnourished is a particularly complex and demanding

task. New approaches are required both to meet the needs of this especially vulnerable population group and to cope with the growing volume, variety and frequency of new situations arising around the world that threaten their nutritional status.

Crucial **overarching approaches** in this context include defining, in operational terms, where responsibilities lie for improving infant and young child feeding practices, and determining how the resources required to meet these responsibilities can be mobilized. For example, for **governments**, these include areas such as public information and education, pre-service education and training for health workers, programme monitoring and evaluation, and action-oriented research. For **international organizations**, they include establishing standards and guidelines, strengthening national capacities through technical support, and monitoring progress using global data banks and appropriate indicators.

#### 4.5.6 The International Code of Marketing of Breast-milk Substitutes

##### **Progress in implementation and monitoring.**

In May 1981, the Thirty-fourth World Health Assembly adopted the International Code of Marketing of Breast-milk Substitutes (30) in the form of a recommendation. The Assembly urged Member States to translate the Code into national legislation, regulations or other suitable measures; to involve all concerned parties in its implementation; and to monitor compliance with it.

Since the adoption of the Code, 160 Member States—84% in all—have reported to WHO on action taken to give effect, in whole or in part, to its principles and aim (Table 13).

Article 11, paragraph 1, of the International Code states that governments should take action “as appropriate to their social and legislative framework, including the adoption of legislation, regulations or other suitable measures”. The tendency observed two decades ago, prior even to the Code’s formal adoption, continues into the present.

Member States are using a **wide range of approaches** to give effect, in whole or in part, to their collective decisions as expressed in the International Code and in relevant resolutions of the Health Assembly. Patterns of activity in this connection have consistently included the following:

- adoption of new legislation and regulations;
- review, amendment and updating of existing legislation and regulations;

TABLE 13

**Member States reporting on action taken giving effect to the International Code of Marketing of Breast-milk Substitutes, 1981–2000**

WHO Region	Member States	Member States reporting	% of Member States reporting	Territories reporting
Africa	46	38	83	
The Americas	35	34	97	6
South-East Asia	10	8	80	
Europe	51	33	65	
Eastern Mediterranean	22	21	95	
Western Pacific	27	26	96	6
<b>Total</b>	<b>191</b>	<b>160</b>	<b>84</b>	<b>12</b>

- preparation and updating of guidelines, e.g. for health workers, manufacturers, distributors and retail outlets;
- negotiation and updating of agreements with health workers and infant-food manufacturers;
- administrative, legislative, or voluntary measures either permitting donations or low-price sale of relevant supplies only through official channels, or disallowing the practice entirely; and
- establishment of committees responsible for monitoring and evaluating implementation of national measures adopted to give effect to the International Code.

Based on action taken during the period from 1994 to 2000, a number of **patterns** can be discerned among national approaches. Time will tell whether they are isolated events or the beginning of a trend in the ways that governments deal with evolving market and sociocultural conditions. In any event, presently they include the following:

**Reinforcing existing measures.** Governments show a willingness to re-visit, often more than once, and to strengthen relevant national measures which have been adopted to give effect to the International Code in the light of evolving circumstances. Examples of this trend include Argentina, Australia, Malaysia, Mozambique, New Zealand, Poland, Singapore, Sweden, Switzerland, and Thailand.

**Broadening the scope of action.** Some countries have broadened the scope of national action to include some, or even all, commercial

food products for infants (12 months of age or younger), e.g. Argentina, Australia, Bahrain, Botswana, Costa Rica, Madagascar, Malaysia, Senegal, Sweden and Viet Nam. Some countries have included older children (1–3 years), e.g. Mozambique and the United Republic of Tanzania. Frequently, these measures explicitly include follow-up formula, which was not widely available when the Code was adopted in 1981 but which was mentioned in a later resolution (WHA39.28).

**Strengthening monitoring.** Monitoring implementation of national action continues to be strengthened, e.g. in Argentina, Australia, Bahrain, Bangladesh, Malaysia, New Zealand, Oman, Senegal, Switzerland, Thailand, and the United Arab Emirates. Often this process includes drawing public attention to infractions by manufacturers and distributors and imposing sanctions.

**Providing infant formula for social purposes.** The precise circumstances under which genuine supplies of infant formula for meeting the long-term nutritional needs of individual infants who have to be fed on breast-milk substitutes, e.g. in orphanages, are being explicitly defined, e.g. in Bahrain, Botswana, Madagascar, and the United Republic of Tanzania.

**Prohibiting samples.** Distributing product samples to the general public and mothers continues to be singled out in many countries as a prohibited promotional tool, e.g. in Côte d'Ivoire, Dominican Republic, Honduras, Madagascar, Mozambique, Poland, Senegal, Trinidad and Tobago, and the 15 members (31) of the European Union in conformity with European Directive 91/321/EEC.

### Recent developments (1999–2000)

**France** has published a decree stipulating conditions and requirements concerning documentation on infant feeding, and the free distribution of infant formula by manufacturers and distributors.

**Guinea** has prepared a draft decree concerning the International Code. **Malaysia** issued warning letters to nine companies that had violated the national Code of Ethics for Infant Formula Products. **Panama** has published its law on the protection and promotion of breastfeeding, including the establishment of the National Commission for the Promotion of Breastfeeding.

WHO has yet to hear from 31 of its 191 Member States on action they may have taken to give effect to the International Code. Since 1998, **Croatia** and



**Georgia** have reported for the first time, respectively, on the development of a breastfeeding promotion act and the adoption of a national code of marketing of breast-milk substitutes.

### Reporting on action taken

Since 1982, NHD has been responsible for collecting information from Member States and other interested parties, and preparing every two years the report by the Director-General on infant and young child nutrition. This report includes the International Code, and is presented to the Executive Board and the World Health Assembly. Since the Code was adopted in 1981, eleven such reports have been prepared (Table 14).

In 1998, in addition to the summary and comprehensive reports to the World Health Assembly on infant and young child nutrition and the International Code, a more detailed document (WHO/NUT/98.11) was prepared on action taken during the period 1994–1998 by a total of 63 Member States.

Also included was a summary of the support given by a number of nongovernmental organizations, including 30 affiliates of the International Baby Food Action Network (IBFAN), in as many countries, in Africa, the Americas, the Eastern Mediterranean, Europe, and the Western Pacific.

TABLE 14

### Reports to WHO's governing bodies since 1981 on infant and young child nutrition, including progress in implementing the International Code of Marketing of Breast-milk substitutes

Year	No. of pages	Document reference	Resolution
1981	8	A34/7	WHA34.22
1982	28	WHA35/1982/REC/1, Annex 5	WHA35.26
1983	39	A36/7	
1984	42	WHA37/1984/REC/1, Annex 5	WHA37.30
1986	37	WHA39/1986/REC/1, Annex 6	WHA39.28
1988	33	WHA41/1988/REC/1, Annex 10	WHA41.11
1990	48	WHA43/1990/REC/1, Annex 1	WHA43.3
1992	29	WHA45/1992/REC/1, Annex 9	WHA45.34
1994	45	WHA45/1992/REC/1, Annex 1	WHA47.5
1996	2	A49/4	WHA49.15
1998	3 + 12	A51/6/IX + A51/INF.DOC./3	
2000	5 + 5	A53/7 + A53/INF.DOC./2	

### Technical support to Member States

WHO regularly responds to requests for technical support from governments of Member States, e.g. draft regulation in the **United Republic of Tanzania** (1994), in **Botswana** and **Mozambique** (1996), draft codes of practice in **New Zealand** (1997), and the scope of existing measures to give effect to the International Code in **Australia** (1998).

In 1999, WHO provided support to **Australia** (relating to the draft national Code of Conduct and queries from the Advisory Panel on the Marketing in Australia of Infant Formula); to **New Zealand** (concerning decisions of the New Zealand WHO Code Compliance Committee); and to **Pakistan** (concerning the draft Protection of Breastfeeding and Young Child Nutrition Act). Also in 1999, WHO organized **training workshops** on the International Code in Thailand and Benin for senior public health officials from **Benin, Burkina Faso, Central African Republic, Côte d'Ivoire, Gabon, Guinée, Mali, Niger, and Togo**.

### A common review and evaluation framework

As part of its continuing effort to support Member States, WHO has produced a framework (32) which allows countries themselves to review and evaluate their progress. Covering the preamble and each

of the Code's eleven articles, and emphasizing information collection and analysis, the framework permits users to describe what action has been taken or is under way, to give effect to the International Code; identify factors that have facilitated or hindered action; assess the impact of action; and make appropriate recommendations.

Annexes include suggested approaches to assessing informational and educational materials intended to reach mothers and the general public, information provided by manufacturers and distributors to health professionals regarding products within the scope of the Code, and the adequacy of product labels. Also included is a list of observations that an assessment team could use to structure site visits to health care facilities and a series of

sample questionnaires for obtaining relevant information from key informants. The competent authorities are invited to use the framework, and adapt it where appropriate, to their specific circumstances.

#### 4.5.7 Complementary feeding

In many countries infant and young child malnutrition, growth failure, and morbidity and mortality are associated with faulty complementary feeding practices. These are often compounded by the fact that nutritionally inadequate—and frequently contaminated—foods are **often introduced too early** (in developing and developed countries) **or too late** (in developing countries). Indeed, the growing consensus is that the greatest nutritional threat to children occurs during the period from about 6 to about 24 months of age, when the transition from exclusive breastfeeding to the consumption of the usual family diet occurs and when infectious disease rates, particularly diarrhoea, are highest.

#### Activities

WHO is therefore **intensifying its technical support** to Member States to help improve complementary feeding practices. This includes reviewing the scientific evidence as a basis for making sound infant feeding recommendations (33); assessing complementary feeding practices using household, community, and national indicators; organizing regional workshops; identifying research priorities; and developing guidelines for community health workers that are consistent with WHO's "integrated management of childhood illness" approach.

Among NHD's main activities in the area of complementary feeding are:

- Workshops, organized in the African Region in 1994 and the Eastern Mediterranean Region in 1995 to review complementary feeding practices and related technology developed in countries (34), and in the South-East Asia Region where Member States have made the subject a research priority.
- An expert consultation at ORSTOM, a collaborating centre in nutrition, convened in Montpellier, France (1995) (35) by WHO as part of a joint WHO/UNICEF initiative on complementary feeding. Technical background documentation consisted of a draft state-of-the-art review of scientific information on complementary feeding prepared by the Program of International Nutrition of the University of California

at Davis (USA). The objectives of the consultation were to formulate recommendations based on the review; reach consensus on guidelines for strengthening existing programme interventions and develop new strategies for ensuring optimal infant feeding practices; and identify areas for additional research.

- A consultation of WHO collaborating centres in nutrition in Geneva (1996), subsequently convened to identify basic priority operational research issues, and to develop a joint programme of work. The consultation identified the following list of priorities.
  - the age of introduction of complementary foods;
  - the basic information needed to plan interventions and formulate guidelines;
  - the study of processing techniques such as fermentation;
  - energy density, feeding frequency, and appetite;
  - micronutrients;
  - food safety;
  - design and evaluation of community-level interventions; and
  - behavioural issues.

#### Complementary feeding of young children: guidelines for health workers

The Department of Nutrition for Health and Development, in collaboration with the Department of Child and Adolescent Health and Development and the London School of Hygiene and Tropical Medicine, has just published a guide on complementary feeding for health workers (36). The book deals with the period when a child continues to receive breast milk but also needs increasing amounts of other foods before graduating to the usual family diet. It shows that breast milk can continue to be an important source of nutrients until the child is at least two years old and how mixtures of family foods can meet children's nutritional needs during this vulnerable period.

The book tells when to start complementary feeding, what to give, how much and how often. It also explains how to encourage children to eat enough, how to keep their food clean and safe, and how to feed sick children. Taking into account the results of recent studies on young child feeding, growth and childhood illness, including diarrhoea, the book is meant to provide health workers and their trainers an understanding of the nutritional value of local foods and how to counsel mothers and other caregivers in this regard. It should be

particularly useful for use during WHO/UNICEF courses on the integrated management of childhood illness (37), and other breastfeeding counselling (38) or training courses (39).

NHD is developing a three-day training course on complementary feeding to translate the most recent scientific evidence into practical messages for health workers, in collaboration with the Family and Community Health cluster and the Instituto de Investigación Nutricional, a WHO Collaborating Centre in Lima, Peru. A technical consultation is being organized for late 2000 to review the first draft of the training module. NHD will also be developing indicators for evaluating complementary feeding practices.

As part of the follow-up to the March 2000 technical consultation on infant and young child feeding, NHD is working close with WHO's Regional Office for the Eastern Mediterranean to organize a consultation on complementary feeding late in 2000 with a focus on:

- improving the quality of complementary foods, specifically increasing energy density while ensuring adequate intake and bioavailability of micronutrients, particularly iron and zinc;
- determining the scope for low-cost fortified processed complementary foods for the rapidly growing populations of the urban poor;
- identifying ways to enable especially poor urban working women to have access to appropriate complementary foods; and
- formulate recommendations for the development of standards dealing with the production and marketing of complementary foods that are consistent with the Codex Alimentarius and the International Code of Marketing of Breast-milk Substitutes.

#### 4.5.8 An evaluation of the infant-feeding content of medical textbooks

One of the most important means of protecting and promoting breastfeeding is to influence the **attitudes and practices of health professionals** responsible for maternal and child care. A key to reaching physicians, who are highly influential members of the health care team, is to provide accurate, up-to-date information on breastfeeding in the textbooks used to train them.

In close collaboration with the Institute of Reproductive Health (IRH) at Georgetown University (USA) and IBFAN, NHD evaluated the breastfeeding content of the main **textbooks used by medical schools** worldwide to teach infant feeding. This

was done through a questionnaire survey which was sent to medical schools around the world. Results show that information is obtained from a large number and a variety of textbooks, including paediatric, infant feeding, general nutrition, general medical, obstetric, gynaecology, and breastfeeding texts. Paediatric textbooks were most often reported, and English-language textbooks were the most widely disseminated.

**Results:** Of the most widely used textbooks that were included in the survey, most met less than one quarter of the survey's criteria for complete and accurate information. Such low scores reflect both the **paucity and the outdated nature** of the breastfeeding information presented, in addition to substantial omissions. Many outdated practices that can hinder the successful establishment of breastfeeding continue to be described in the majority of textbooks that are used by medical students and in reference texts for other health professionals.

**Conclusion:** Georgetown University published a final report (40) of this evaluation, which was prepared in collaboration with WHO and IBFAN. It is hoped that there will be a second phase of working with editors and publishers of the evaluated textbooks to update their infant-feeding content.

## 4.6 Nutrition in emergencies

Malnutrition is rampant among **refugees and displaced populations**, representing 21.5 million people in 1999. Many are at risk of malnutrition and death. The risk depends on factors such as the state of civil insecurity, food unavailability and inaccessibility, and inadequate delivery of assistance. Micronutrient deficiencies such as scurvy, pellagra, and beriberi are seen in populations entirely dependent on food aid. Anaemia, vitamin A deficiency, and IDD are also prevalent in these population groups.

NHD addresses some of these problems through its **normative and standard-setting work**:

- The manual *The management of nutrition in major emergencies* is addressed to health and nutrition professionals working in emergencies. It covers estimation of energy, protein, and other nutrient requirements in a population; assessment and management of malnutrition and related health problems; general and selective feeding programmes; and human resources development.

- The preparation of three **simplified field guides** (*Determining nutrition requirements; Assessing and monitoring nutrition status; Food distribution and nutrition action*) for health workers and humanitarian aid workers.
- **Technical reviews** on the prevention and control of scurvy, pellagra, and thiamine deficiency were prepared following a request from UNHCR. Intended to help in the diagnosis, management and prevention of outbreaks of these deficiency disorders, they include the following three titles and document numbers:
  - *Scurvy and its prevention and control in major emergencies*. WHO/NHD/99.11;
  - *Thiamine deficiency and its prevention and control in major emergencies*. WHO/NHD/99.13;
  - *Pellagra and its prevention and control in major emergencies* (in preparation).
- The preparation of the **Guiding principles for feeding infants and young children in emergencies**. This document sets out basic principles for the feeding of infants and young children in emergency-affected populations. Much of the disability and death in emergencies could be averted through proper feeding and nutritional care.
- **Training modules** are being developed together with CAH, LINKAGES, UNICEF, and IBFAN for humanitarian aid workers on the subject of infant feeding in emergencies.
- The development of **Guiding principles for caring for the nutritionally vulnerable during emergencies**. NHD, jointly with UNHCR, organized a technical consultation on caring for the nutritionally vulnerable during emergencies in Rome (1998). Information on nutritional vulnerability and its contributing factors has been compiled and overall guiding principles for caring for the nutritionally vulnerable during emergencies are being further developed based on the recommendations from the consultation.
- The following documents are also being prepared in the area of **caring for the nutritionally vulnerable**: *Caring for the Nutritionally vulnerable during emergencies: A review of the issues and implications for policy*; *Caring for the nutritionally vulnerable during emergencies: An annotated bibliography*; and *Nutritional vulnerability among the Saharawi refugees: A case study report*.

Besides NHD's normative and standard-setting work, the Department gives **technical advice**, maintains **collaborative linkages**, and **works with countries** in collaboration with WHO/EHA and the regional offices:

- **The Sphere Project**: NHD was a member of the Working Group on Nutrition for this project, which established minimum standards in disaster response.
- **Support to governments and agencies**: NHD maintains a roster of names of potential consultants who are available at short notice to undertake missions related to nutrition in emergencies. For example, just recently, NHD assisted UNICEF in Baghdad to find a consultant for their programme.
- **Assessment mission**: NHD participated in a joint assessment in Calcutta (1998) on the UN capacity to respond to emergency situations in India. In the context of UNDAF, the UN Disaster Management Team in India asked for an assessment to ensure that the combined resources and expertise of the UN agencies were used in a more effective manner. A proposal was drafted jointly by WFP, UNICEF, FAO, UNDP and WHO, and was endorsed by the Government.
- **Assessment mission**: NHD assisted with the WHO operation in Orissa after the cyclone in November 1999. An assessment of the food and nutrition situation was made and recommendations prepared in close collaboration with other UN agencies, NGOs, and the Government.
- **Regular collaboration with UNHCR, WFP, UNICEF and with NGOs**. This is an important part of NHD's work in the field of nutrition in emergencies. Just a few examples include: collaboration with UNHCR on the development of the UNHCR/WFP guidelines on estimating food and nutritional needs in emergencies and on selective feeding programmes in emergency situations; participation in the establishment of the ENN/Emergency Nutrition Network, whose secretariat is in Dublin, and the financial contribution to the production and distribution of its newsletter *Field Exchange*; and participation in the workshops of the Interagency Group on Food and Nutrition in Emergencies.

#### Activities planned for 2000–2001

- **Increased capacity for assessment and management of nutrition in emergencies**: translate into French and Spanish the manual *The management of nutrition in major emergencies*; finalize/print/disseminate the document *Guiding principles on Feeding Infants and Young Children in Major Emergencies*; and finalize/print/disseminate the three-part pack on nutrition in emergencies.
- **Prevention/ control of micronutrient deficiencies in emergencies**: develop user-friendly field tests for the assessment of micronutrient



deficiencies in emergency-affected populations; develop guidelines for fortification of foods for emergency-affected populations; develop document on assessment of micronutrient deficiencies in emergencies; and finalize/print/disseminate document *Pellagra and its prevention and control in major emergencies*.

- Technical support and collaboration with EHA/WHO, and with UNHCR, WFP, and other international humanitarian/relief agencies and countries, for addressing nutrition in emergency and disaster-affected populations; provide technical guidance to agencies and governments on nutritional standards; food/ration composition; assessment of malnutrition/specific deficiencies; monitoring nutritional status, for both prevention/early warning/urgent response when emergencies arise; participate in joint UN assessment/monitoring/programme formulation teams for nutritional aspects for prevention/rapid response as emergencies arise; and support to the Emergency Nutrition Network.

## 4.7 Food Aid for Development

Food aid in the context of development, beyond emergency relief, is one way of concretely addressing **the needs of the nutritionally vulnerable**. It can be provided directly to those most in need to supplement an inadequate diet or to serve as an incentive to reach out for a better life. As the directing and coordinating authority on international health work, WHO has a mandate to contribute to the effectiveness of food aid.

### The role of food aid

For many households, **the need to provide for the next meal** is so pressing that the smallest investment of time or energy in tomorrow is practically impossible. Women who spend hours each day in search of food, water, and firewood are unlikely to attend a prenatal clinic, for example, or attend the demonstration of new agricultural technology. Hungry people cannot take advantage of opportunities, such as training, clinics, education, or credit. This becomes a stumbling block to achieving a better life.

**Food aid** can be used to provide the missing bridge. Food aid can be an effective incentive to encourage regular participation in health activities such as antenatal care, immunization, and health and nutrition education. It has also been used to encourage participation in activities to improve community infrastructure, through food-for-work

programmes. Food aid can help families keep their children, especially girls, in school. This represents a long-term positive step for families in alleviating social and economic disadvantages.

Food aid is a valuable asset in breaking the **persistent cycle** of hunger, poverty, and ill health. The most effective food aid is linked to interventions, such as disease control, environmental health, and the promotion of good health and nutrition habits, which address the major causes and the contributing factors of malnutrition. Because of the pivotal role played by women in the health of their families, it is especially important that women and adolescent girls be the beneficiaries. They must be appropriately targeted with appropriate rations that are appropriately distributed. It is also essential that gains made through food aid programmes be sustainable. This often means the use of locally produced blended foods, thus providing support for local employment.

### WHO and WFP

The United Nations agency responsible for international food aid, the World Food Programme (WFP), was established in January 1963. **Cooperation between WFP and WHO** began soon after the commencement of WFP's activities with the establishment of the liaison officer post in WHO in April 1963.

Today, as the UN health and nutrition adviser to the WFP, the NHD Food Aid for Development (**FAD**) team focuses on serving as the liaison office between WHO and WFP and providing assistance to WFP in the identification, planning, and evaluation of food-assisted programmes and projects. This is accomplished through country-level assistance in the form of participation in WFP interagency evaluation and appraisal/formulation missions and contributions to WFP policy and programme/project documents. As currently structured, all the activities of this team are performed at the request of WFP.

### Activities in 1999

**Country-level assistance: evaluation, review, and appraisal.** During 1999, a large part of FAD activities were devoted to participation in interagency (e.g. FAO, ILO, UNESCO) evaluation and appraisal missions to WFP-assisted development projects. In some cases, the missions are requested by the Evaluation Service (OEDE) of WFP. In other cases, it is the respective regional offices that make the request.

In these missions, the WHO participant, follow-

ing specific terms of reference, evaluates the health aspects and implications of a food-aid project or programme as well as its nutritional aspects. WHO is asked to participate primarily in missions that evaluate or review maternal-child-health supplementary feeding projects, urban and rural sanitation projects, and school-feeding projects.

Attention is devoted to several **criteria for evaluation**. The mission determines whether the project has met both the nutritional and health care standards of WHO; whether it has considered other relevant health-related aspects in addition to meeting the project's original objectives, and whether the project or programme supports the national health and nutrition policy or strategy.

**In 1999**, FAD participated in evaluation or review missions to WFP-assisted projects in Benin, Bolivia, Chad, Ecuador, Honduras, Nepal, Nicaragua, Tanzania, and Zambia.

**National capacity building.** As a follow-up to a review and appraisal mission to Yemen in the summer of 1997, FAD was asked to provide a training programme for medical doctors, midwives, and nurses involved in implementing the project. The training was conducted entirely in Arabic by FAD's team coordinator at two sites in Yemen in November 1998.

**It focused** on improving the quality of the project, and included topics that related not only to the project but also to the participants' general activities. Information on prenatal care, postnatal care, growth monitoring, and health and nutrition education was presented. Also included were the selection of beneficiaries, use of the items in the food basket, and monitoring and evaluation.

### Contribution to policy and programme/project documents

**Country programmes.** As WFP moves in its activities from a 'project approach' to a 'country programme approach', WHO has been requested to provide on-site inputs into the development of country programmes. In these missions, the WHO participant is responsible for a comprehensive analysis of the health policies and strategies in the country and for the assessment of its health and nutrition situation, to identify priorities and propose relevant interventions.

In 1998, this was undertaken for the WFP country programme in Nepal, where NHD sent a participant for five weeks to visit various sites in the country, meet with government and NGO representatives, and prepare the draft of the country programme document.

**Sectoral operations guidelines.** As part of

training for its field and headquarters staff, WFP is in the process of developing operations guidelines in several sectors (for example, in education or rehabilitation), reflecting WFP's policies. During 1998, FAD participated extensively in the preparation and revision of Guidelines for the Supplementary Feeding of Mothers and Children. Further work on this document was completed in 1999.

**Guidelines on Collaboration with Specialized Agencies.** To facilitate ease of access by WFP field offices to the services of the technical liaison offices (at FAO, ILO, UNESCO, and WHO), WFP initiated the preparation of operations guidelines for this purpose. In 1998, FAD contributed substantially to a set of Guidelines for the Use of Technical Assistance.

## 4.8 Emerging issues of growing public health importance

### 4.8.1 Adolescent nutrition: a neglected dimension

The world's adolescent population—1200 million persons 10–19 years of age, or about 19% of the total population—faces a series of **serious nutritional challenges** not only affecting their growth and development but also their livelihood as adults. Yet adolescents remain a largely neglected, difficult-to-measure, and hard-to-reach population, in which the needs of **adolescent girls in particular** are often ignored.

Adolescence is a particularly unique period in life because it is a time of intense physical, psychosocial, and cognitive development. Increased nutritional needs at this juncture relate to the fact that adolescents gain up to 50% of their adult weight, more than 20% of their adult height, and 50% of their adult skeletal mass during this period.

**Caloric and protein requirements are maximal.** Increased physical activity, combined with poor eating habits and other considerations, e.g. menstruation and pregnancy, contribute to accentuating the potential risk for adolescents of poor nutrition. In summary, the **main nutrition problems** affecting adolescent populations worldwide include:

- undernutrition in terms of stunting and thinness, catch-up growth, and intrauterine growth retardation in pregnant adolescent girls;
- iron deficiency and anaemia;
- iodine deficiency;
- vitamin A deficiency;

- calcium deficiency;
- other specific nutrient deficiencies, e.g. zinc, folate; and
- obesity.

The area of adolescent health is difficult to study. There are many unknown factors and consequences for all of these forms of malnutrition during adolescence, in terms of standards, measurement indicators and health consequences.

**Activities:** Malnutrition among adolescent girls in South-East Asia is an exceptionally large and complex problem. To review the situation thoroughly and formulate appropriate recommendations and guidelines for action by the Region's Member States, the Programme of Nutrition in WHO's South-East Asia Regional Office, in collaboration with the adolescent health and maternal and child health programmes, organized a regional consultation of experts in New Delhi (1997).

The consultation's **recommendations for action**, which are directly relevant to other regions, include:

- an international growth reference suitable for adolescent children should be developed;
- assessment, advocacy, prevention and control initiatives need to be specifically developed in most countries to reduce anaemia in adolescent girls;
- community-based approaches need to be developed for the sustained strengthening of household food security with emphasis on nutritional adequacy for adolescent girls;
- mass information and awareness programmes are needed to alert governments and communities to the importance of health and nutrition for adolescent girls;
- an urgent need to ensure a sustainable adequate intake of iodine by all adolescent girls and women of childbearing age prior to conception—in the long term through iodized salt and, if necessary, in the short term through distribution of iodized oil capsules; and
- an urgent need to ensure adequate folate intake by adolescent girls and women of childbearing age prior to conception, in populations where there is an increased risk of neural tube defects.

**As a result** of the recommendations from the above-mentioned consultation, a WHO training programme for regional focal points for adolescent nutrition in the ministries of health and education in Member States of the Region was held at the Institute of Nutrition at Mahidol University in Thailand (1999).

As noted in Section 4.3.4, NHD worked closely with the Department of Essential Drugs and other Medicines (EDM) to present scientific evidence concerning **folic acid requirements** to the WHO Expert Committee on Essential Drugs. As a result, the WHO Model List of Essential Drugs has now been modified, and the recommended folate supplement for use during pregnancy has increased from 250 µg to 400 µg per day.

#### 4.8.2 Ageing and nutrition: a growing global challenge

Both the **number and the proportion of older persons**—defined as aged 60 and over—are growing in virtually all countries, and present worldwide trends are likely to continue unabated. Today there are an estimated 580 million elderly people in the world, about 350 million (61%) of whom live in developing countries. By 2020, the figure is expected to rise to 1000 million elderly people, with 710 million (71%) living in developing countries.

One of the recommendations of the **International Conference on Nutrition** (1992) was that each country should make a firm commitment to promoting the nutritional well-being of its people, with priority given to the most nutritionally vulnerable groups. It was recognized that older persons are just such a group and that governments, in collaboration with other concerned parties, should promote caring for them through traditional forms of family support and the introduction of special measures where needed.

#### The challenge of a sex-differential imbalance

**Women comprise the majority of the older population** in virtually all countries, largely because globally women live longer than men. By 2025, the number of older women in Asia is projected to soar from the current 107 to 248 million, and in Africa from 13 to 33 million. This pattern involves its own special nutritional needs, emphases, and patterns of malnutrition, including for example the incidence of osteoporosis in older women.

**Osteoporosis** and associated fractures are a major cause of illness, disability and death, and are a huge medical expense. It is estimated that the annual number of hip fractures worldwide will rise from 1.7 million in 1990 to around 6.3 million by 2050. Women suffer 80% of hip fractures; their lifetime risk for osteoporotic fractures is at least 30%, and probably closer to 40%. In contrast, the risk is only 13% for men.

**Women are at greater risk** because their bone loss accelerates after menopause. Prevention is

possible with hormone therapy at menopause. Lifestyle factors—especially diet, but also physical activity and smoking—are also associated with osteoporosis, which opens the way for primary prevention. The main aim is to prevent fractures; this can be achieved by increasing bone mass at maturity, by preventing subsequent bone loss, or by restoring bone mineral. Particularly important are adequate calcium intake and physical activity, especially in adolescence and young adulthood.

### Defining the specific nutritional needs of older persons

Elderly people are particularly **vulnerable to malnutrition**. Moreover, attempts to provide them with adequate nutrition encounter many practical problems. First, their nutritional requirements are not well defined. Since both lean body mass and basal metabolic rate decline with age, an elderly person's energy requirement per kilogram of body weight is also reduced.

The process of ageing also affects **other nutrient needs**. For example, while requirements for some nutrients may be reduced, some data suggest that requirements for other essential nutrients may in fact rise in later life. There is thus an urgent need to review current recommended daily nutrient allowances for this group. There is also an increasing demand worldwide for WHO guidelines which competent national authorities can use to address the nutritional needs of their growing elderly populations.

### Malnutrition and older persons

Many of the diseases suffered by the elderly are the result of **dietary factors**, some of which have been operating since infancy. These factors are then compounded by changes that naturally occur with the ageing process.

Dietary **fat** seems to be associated with cancer of the colon, pancreas and prostate. Atherogenic risk factors such as increased blood pressure, blood lipids and glucose intolerance, all of which are significantly affected by dietary factors, play a significant role in the development of coronary heart disease.

Degenerative diseases such as cardiovascular and cerebrovascular disease, diabetes, osteoporosis and cancer, which are among the most common diseases affecting the elderly, are all diet-affected. Increasingly in the diet/disease debate, the role that **micronutrients** play in promoting health and preventing noncommunicable disease is receiving considerable attention. Micronutrient deficiencies

are often common in elderly people due to a number of factors such as their reduced food intake and a lack of variety in the foods they eat.

Another factor is the **price** of foods rich in micronutrients, which further discourages their consumption. Compounding this situation is the fact that the elderly often suffer from **decreased immune function**, which contributes to this group's increased morbidity and mortality. **Other** significant age-related changes include the loss of cognitive function and deteriorating vision, all of which hinder good health and dietary habits in old age.

**Elevated serum cholesterol**, a risk factor for coronary heart disease in both men and women, is common in older people and this relationship persists into very old age. As with younger people, drug therapy should be considered only after serious attempts have been made to modify diet. Intervention trials have shown that reduction of blood pressure by 6 mm Hg reduces the risk of stroke by 40% and of heart attack by 15%, and that a 10% reduction in blood cholesterol concentration will reduce the risk of coronary heart disease by 30%.

**Dietary changes** seem to affect risk-factor levels throughout life and may have an even greater impact in older people. Relatively modest reductions in saturated fat and salt intake, which would reduce blood pressure and cholesterol concentrations, could have a substantial effect on reducing the burden of cardiovascular disease. Increasing consumption of fruit and vegetables by one to two servings daily could cut cardiovascular risk by 30%.

### Activities

In the light of the pressing need to review factors affecting the nutritional status of older persons, and to update relevant nutrition guidelines, NHD has been collaborating with the programme on Ageing and Health on a number of nutrition and ageing activities, especially contributing to the 1999 **International Year of Older Persons**. There has also been collaboration with the United States Department of Agriculture's Human Nutrition Research Center on Aging at Tufts University, Boston, USA. These efforts led to the organization of a **joint consultation** in Boston (1998) on the most recent scientific data on the role of nutrition in disease prevention and health promotion among older persons.

**Recommendations** were made at this meeting concerning:

- epidemiological and social aspects of ageing;
- factors affecting dietary intake and nutrient absorption in older persons;



- nutritional requirements of older persons;
- nutrition and older persons in developing countries;
- nutrition and immune function among older persons;
- dietary guidelines for older persons;
- community support for improved nutrition for older persons; and
- community-based interventions.

## Outputs

A comprehensive report on the results of this joint WHO/Tufts University consultation will be published in 2000, with **practical recommendations** for:

- governments;
- nutritionists and medical practitioners;
- nurses, care providers and social workers;
- universities and professional organizations; and
- nongovernmental organizations.

**Technical and financial support** will also be provided for regional and national meetings, and to support development of national guidelines and recommendations for promoting good nutrition for older persons in selected countries.

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- 14 The WHO Consultation on Obesity (Geneva, June 1997) was organized jointly by the Departments of Nutrition for Health and Development (NHD) and Noncommunicable Diseases (NCD), in collaboration with the International Obesity Task Force (IOTF), a subgroup of the International Association for the Study of Obesity (IASO) which is the umbrella organization representing national obesity associations from over 30 countries.
- 15 The interim version of the report was published in early 1998 (WHO/NUT/NCD/98.1). The final version will be published in the WHO Technical Report Series (TRS) and publication of a summary version is also planned.
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- 18 See *Protecting, promoting and supporting breastfeeding: the special role of maternity services*. A joint WHO/UNICEF statement. Geneva, World Health Organization, 1989.
- 19 *Breastfeeding counselling: a training course* (documents WHO/CDR/93.3–93.6; UNICEF/NUT/93.3–93.4).
- 20 *Promoting breastfeeding in health facilities: a short course for hospital administrators and policy-makers* (Document WHO/NUT/96.3)
- 21 See *Weekly Epidemiological Record*, 1998, 73 (5):25–30; 1998, 73 (13):91–94; and 1998, 73 (19):139–144.
- 22 Document WHO/FRH/NUT/CHD/98.1.
- 23 Document WHO/FRH/NUT/CHD/98.2.
- 24 Document WHO/FRH/NUT/CHD/98.3.
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- 27 See: *Follow-up of the WHO/UNICEF Meeting on Infant and Young Child feeding* (9–12 October 1979). Report by the Director-General. Document WHA33/1980/REC/1, Annex 6.
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  - 29 The *WHO Multicentre Growth Reference Study* (see annex of Document A53/7) is expected to contribute to improved understanding of the age range during which breast milk alone is sufficient to meet the healthy infant’s nutritional requirements for growth and development. In addition, WHO is conducting a systematic review of the relevant scientific literature, for the period after the report (1995) of the WHO Expert Committee on physical status, in the context of the development of a new global strategy and plan of action for infant and young child feeding.
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  - 37 *Integrated management of childhood illness* (Document WHO/CHD/97.3).
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  - 40 See: *An evaluation of the breastfeeding content of selected medical textbooks*. Washington, D.C., Institute for Reproductive Health, Georgetown University, 1997.

## **SECTION 5**

# **NUTRITIONAL STANDARD SETTING AND RESEARCH**

- 5.1** Establishing human nutrient requirements for worldwide application
- 5.2** Nutrition research: pursuing sustainable solutions
  - Multicentre Growth Reference Study
  - Multicentre Study on Household Food and Nutrition Security
  - Systematic review of research on the optimal length of exclusive breastfeeding
- 5.3** South-East Asia Nutrition Research-cum-Action Network
- 5.4** The WHO Global Network of Collaborating Centres in Nutrition



## 5.1 Establishing human nutrient requirements for worldwide application

The Department of Nutrition for Health and Development, in collaboration with FAO, continually **reviews new research and information from around the world** on human nutrient requirements and recommended nutrient intakes. This is a vast and never-ending task, given the large number of essential human nutrients. These nutrients include protein, energy, carbohydrates, fats and lipids, a range of vitamins, and a host of minerals and trace elements.

Many countries rely on WHO and FAO to **establish and disseminate this information**, which they adopt as part of their national dietary allowances. Others use it as a **base for their standards**. The establishment of human nutrient requirements is the common foundation for all countries to develop food-based dietary guidelines for their populations.

**Establishing requirements** means that the public health and clinical significance of intake levels—both deficiency and excess—and associated disease patterns for each nutrient, need to be thoroughly reviewed for all age groups. Every ten to fifteen years, enough research is completed and new evidence accumulated to warrant WHO and FAO undertaking a revision of at least the major nutrient requirements and recommended intakes.

### Activities and outputs

The following **major revisions of nutrient requirements**, including their role in health and disease, have been undertaken and published in the last four years:

- Trace elements in human nutrition and health (WHO/FAO/IAEA), WHO, Geneva 1996.
- Fats and oils in human nutrition (FAO/WHO), FAO, Rome 1994.
- Preparation and use of food-based dietary guidelines (WHO/FAO), WHO, Geneva 1996.
- Carbohydrates in human nutrition (FAO/WHO), FAO, Rome 1998.

### Forthcoming outputs

During the 1980s WHO and FAO reviewed the requirements for protein, energy, vitamin A, folate, iron, and several other vitamins and minerals. With regard to vitamins and minerals, there is enough **new research** to once again justify updating our information on the subject. For example, there is a great deal of new evidence indicating that besides

preventing deficiency diseases, some vitamins and minerals play an important role in preventing diet-related chronic diseases, one of modern society's major causes of morbidity and mortality. Evidence is also mounting on the importance of micro-nutrients for immune function, physical work capacity, and cognitive development, including learning capacity in children.

Accordingly, WHO and FAO organized a **joint expert consultation** in Bangkok (September 1998). The principal purposes of this expert consultation were to:

- review new scientific information since the last FAO/WHO publication on specific nutrient requirements (1974) and prepare recommendations for daily nutrient intakes for infants, children, young and older adults, and pregnant and lactating women; and
- develop a report on human nutrition requirements to serve as an authoritative source of information for Member States in planning and procuring food supplies for population subgroups, interpreting food-consumption surveys, establishing standards for food-assistance programmes, and designing nutrition education programmes.

The scope of the expert consultation, and the subsequent recommended nutrient requirements, included **over twenty essential nutrients**. These nutrients comprise the basis of all human nutrition:

protein, energy, vitamin A and carotene, vitamin D, vitamin E, vitamin K, thiamine, riboflavin, niacin, vitamin B<sub>6</sub>, pantothenic acid, biotin, vitamin B<sub>12</sub>, folate, vitamin C, antioxidants, calcium, iron, zinc, selenium, magnesium and iodine.

For each nutrient, consideration was given to function, metabolism, dietary intake patterns, requirement levels, and toxicity. Basal requirements, safe intake levels, recommended dietary allowances, and tolerable upper intake levels are to be established for each. A detailed technical report of the Joint WHO/FAO Expert Consultation, in addition to a briefer handbook on human nutrient requirements, were published in 1999.

## 5.2 Nutrition research: pursuing sustainable solutions

### Approaches

The Department of Nutrition for Health and Development supports, or otherwise collaborates

in, nutrition research in five main ways (see box). Such a **variety of approaches** is necessary not only because of the broad spectrum of nutritional issues requiring investigation, but also because of the sheer volume of research being undertaken worldwide by nutrition institutes, government nutrition units, and universities.

NHD uses these approaches, whether directly or through its coordinating function, to ensure that a just portion of **available resources** is **applied in search of sustainable solutions to crucial issues of global public health significance**. Highlights of current activities are summarized in the following pages.

#### WHO's five main approaches to supporting nutrition research involve:

- multicentre/multicountry nutrition studies,
- regional nutrition research networks and initiatives,
- nutrition research and training through global collaborating centre networks in nutrition,
- direct technical/financial support for nutrition research activities by nutrition units, nutrition institutes and others; and
- collaboration within WHO on research projects having nutrition-related outcomes.

### 5.2.1 Multicentre growth reference study

**Background.** In 1993, a WHO Expert Committee (1) drew attention to a number of serious technical and biological problems with the growth reference currently recommended for international use. The Committee challenged its suitability and expressed serious concern that a reference based on children who were primarily artificially fed was inappropriate for assessing the growth of breastfed infants. Recent research conducted by WHO (2) shows that the growth pattern of healthy breastfed infants differs significantly from the current international reference. The negative deviations are large enough to lead health workers to make faulty decisions regarding the adequacy of the growth of breastfed infants, and thus to advise mothers to supplement unnecessarily, or even to stop breastfeeding altogether.

Given breastfeeding's health and nutritional benefits, **this potential misinterpretation** of the growth pattern of healthy breastfed infants has great public health significance. The premature introduction of complementary foods can have life-threatening consequences for young infants in

many settings, especially where breastfeeding's role in preventing severe infectious morbidity is crucial to child survival.

In 1994, the World Health Assembly requested the Director-General to develop a **new international reference** to assess the growth of breastfed infants (resolution WHA47.5). WHO's normative function places it in a unique position to provide the leadership required to carry out a project of such complexity and global visibility. In collaboration with several UN agencies and national institutions, WHO began developing a new reference that, unlike the current reference, will be based on an international sample of breastfed infants from healthy populations with unconstrained growth.

#### Issues and objectives

The main **objective of the study** is to establish a new international reference by constructing a set of growth curves suitable for assessing the growth and nutritional status of both population groups and individual children of preschool age.

#### Methodology

**To construct a sound reference of lasting value**, WHO is conducting a multi-country study in diverse geographical settings including Africa, the Americas, Asia, and Europe. Based on a pooled sample of the world's children, the new curves will reinforce the fact that human growth during the first five years of life is very similar across diverse ethnic backgrounds (3,4). This approach should also serve to minimize the political difficulties that have arisen from using a single country's patterns as a worldwide 'standard' for optimal child growth.

The **research design** includes a total of over 10 000 healthy infants and children, by combining a longitudinal study from birth to 24 months of age of 300 newborns per site with a cross-sectional study of children aged 18–71 months involving 1400 children per site. **Key criteria** for the selection of newborns for the study include absence of illness and socioeconomic constraints on growth, and specification of non-smoking mothers who are breastfeeding infants born at term.

**Rigorous scientific standards** are being applied to **this complex cross-cultural field-based project**. **Quality control measures** include regular coordination meetings, careful selection and thorough training of interviewers, specially designed and highly reliable measuring equipment, regular standardization sessions, staff exchanges between sites, and continual quality assessment of completed questionnaires and measurements.



Breastfeeding support provided to mothers participating in the study will help to ensure an unbiased sample by enabling a larger proportion of mothers wishing to breastfeed to actually do so. WHO serves as the **coordinating centre** and is responsible for both the **pooling of data** from study sites and **preparing the new curves** using the best available statistical techniques. Data entered locally, using a centrally prepared data management system, are transferred monthly to WHO, where further quality control is carried out and compliance with the study protocol is assessed.

### Progress to date

The study is underway in **Brazil, Ghana, India, Norway, Oman** and the **USA**. Depending on the availability of funds, data collection is expected to be completed in 2003.

Thus far, in addition to the considerable global and regional resources that WHO has engaged for this exercise, the study's other major supporters include the governments of **Brazil, Canada, Norway, the Netherlands, Oman** and the **USA**, as well as **UNICEF** and **UNU**. Despite this generous financial support, just under a quarter of the study's overall funding remains to be identified to ensure the successful and timely completion of all aspects of the study.

### Benefits of the new growth reference study

The study is expected to have great **public health significance**, in developed and developing countries alike, in terms of its health, nutrition, and child-spacing benefits. The new international growth reference will achieve several important objectives. In particular, it will provide a scientifically reliable yardstick of children's growth achieved under desirable health and nutritional conditions for:

- monitoring the growth and nutritional well-being of individual infants and young children;
- providing accurate community and national estimates of under- and over-nutrition; and
- helping assess or assessing poverty, health and development.

No less important, the new reference will **establish the breastfed infant as the normative model** against which all alternative feeding methods must be measured in terms of growth, health, and development. It will also provide a strong **advocacy tool** for promoting the right of all children to achieve their full genetic growth potential in a **smoke-free environment**. Finally,

and at no additional cost, the study will permit the development of urgently needed **reference data** to assess the nutritional status of lactating women.

### 5.2.2 WHO multicountry study on household food and nutrition security

**Rationale.** It is well recognized that household food insecurity is one of the three underlying causes of malnutrition. At the International Conference on Nutrition (ICN) held in Rome in 1992, food security was defined in its most basic form as "...physical, social and economic access by all people at all times to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life."

Thus, food insecurity exists when people **lack access to sufficient amounts** of safe and nutritious food and are **not consuming the food required** for normal growth and development and an active and healthy life. This may be due to the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate utilization at the household level. Food insecurity, poor conditions of health and sanitation, and inappropriate social and care environment are the major causes of poor nutritional status.

It is difficult to know how many households or even individuals are food and nutrition insecure, given the **multiple dimensions** (chronic, transitory, and short- and long-term) of food and nutrition insecurity and varying degrees of intra-household inequalities in different regions. Because of the lack of a universally applicable indicator and the understanding of household dynamics and related influences, it is difficult to design or evaluate policies and programmes intended to address household food and nutrition security or to examine the impact of other policies and programmes in this connection.

To shed light on these issues, NHD began in 1995 a **multi-country study** on improving household food and nutrition security for the vulnerable. These **vulnerable groups** include infants, young children, adolescents, pregnant and lactating women, the disabled, and older persons.

### Study objectives

The ultimate aim of the study is to develop guiding principles for incorporating cultural, socio-economic and behavioural considerations in development policies and programmes intended to improve household food and nutrition security for the vulnerable. The specific objectives of the study are to:

- identify factors influencing the dynamics of intrahousehold food and other resource distribution for improving nutrition security of the vulnerable;
- stimulate and build national capacity for operational research on determinants of health, nutrition and behavioural change, and approaches to enhancing the health, nurturing, caring, and development functions within households and communities;
- facilitate household and community-based interventions to ensure and enhance family well-being with specific focus on caring for the vulnerable;
- foster the development of human resources and programmes to protect and promote nutrition security of the vulnerable; and;
- collect and disseminate scientific and technical information, and facilitate and encourage an international exchange of ideas and experience in the area of household food and nutrition security.

### Study sites

Given the global dimensions, and the complexity and rapid increase of urban poverty and malnutrition, urban and/or periurban communities have been selected as study sites in all of the **six participating countries**, through the following institutional links:

China	Chinese Academy of Preventive Medicine
Egypt	National Nutrition Institute
Indonesia	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Universitas Indonesia
Ghana	Noguchi Memorial Institute for Medical Research; International Food Policy Research Institute (IFPRI); Rockefeller Foundation; International Development Research Centre (IDRC); UNICEF; and national NGOs
Myanmar	Ministry of Health
South Africa	Department of Paediatrics and Child Health, University of Natal Medical School; University of Zululand, Ministry of Health

In 1999 Cambodia indicated their interest in participating in the study, and some preparatory work was initiated in collaboration with the Cambodian Development and Research Institute, Ministry of Planning, UNICEF, and several NGOs. Due to unforeseen circumstances, however, the study has not yet been implemented.

### Methodology

At most sites, the study is proceeding through the following **six phases**:

- a thorough review of the scientific literature;
- consultation with policy-makers, researchers, international and bilateral agencies, nongovernmental organizations, and community groups;
- qualitative studies at community, household and individual levels, including participatory rapid appraisal studies;
- quantitative data collection;
- data entry, processing and analysis; and
- preparation of the report and dissemination of findings through a national seminar.

### Related analyses

WHO is also undertaking a series of reviews and analyses of the nutritional implications of intrahousehold bias. In 1999, a review and analysis on intrahousehold dimensions of micronutrient deficiencies was undertaken in collaboration with Tufts University (USA).

In addition, household food and nutrition security in societies in transition is being examined. In 1999, at the time of the 8th Asian Congress of Nutrition held in Seoul, Republic of Korea (29 August–2 September 1999), WHO organized a workshop on Achieving Household Food and Nutrition Security in Societies in Transition, in collaboration with FAO. The workshop reviewed and examined the impacts and implications of rapid global transition on nutrition in countries, in particular those in Asia (specifically, Korea and Japan) and the impacts of economic crisis on food and nutrition security in Indonesia. The proceedings of the workshop are being finalized for publication as a WHO document. These proceedings will also be published as a special supplement to the Asia Pacific Journal of Clinical Nutrition.

### Multidisciplinary expert advisory group and review of the study

A multidisciplinary expert advisory group has been formed to review and evaluate the outcomes of the study and to assist WHO in **developing effective and sustainable guiding principles for improving household food and nutrition security** and disseminating them to Member States. The members of the multidisciplinary expert advisory group are experts in nutrition, anthropology, sociology, psychology, agricultural economics, economic geography, communication, and education.



### Progress to date

A mid-project review meeting at the WHO Centre for Health Development in Kobe, Japan (November 1997) brought together principal investigators with experts from various disciplines. The purpose of the meeting was to examine progress and preliminary findings at each study site, share information and experience, and assist some sites with revising their study designs, and analysing and interpreting data. The meeting also reviewed data on intrahousehold resource distribution to identify patterns and contributing factors. Finally, it made an initial identification of possible indicators for household food and nutrition security for the vulnerable.

In 1999, the preliminary outcomes and analyses of the study in China, Indonesia, and Myanmar were presented and reviewed at the joint WHO/FAO workshop on Achieving Household Food and Nutrition Security in Societies in Transition held in Seoul in 1999.

Currently the following reports of the study are being finalized or are in preparation:

- WHO multi-country study on improving household food and nutrition security for the vulnerable: Ghana. Achieving urban food and nutrition security for the vulnerable in Greater Accra (WHO/NHD/00.2);
- WHO multi-country study on improving household food and nutrition security for the vulnerable: South Africa. A qualitative study on food security and caring patterns of vulnerable young children in South Africa (WHO/NHD/00.4); and
- WHO multi-country study on improving household food and nutrition security for the vulnerable: China. (in preparation)

A draft report of the study in China has been received and the final report of the study in Myanmar is scheduled to be completed in May 2000. The report of a qualitative part of the study in Ghana on caring for the nutritionally vulnerable will also be completed in June 2000 and the report of the study in Indonesia is currently being prepared. In Egypt, the study is still in progress.

Furthermore, it is envisaged that after the completion of the multicountry study, a technical consultation on "Policy and programme approaches to achieve household food and nutrition security for all in the 21st century" will be organized. The consultation will review and analyse the outcomes of the WHO multicountry study, review and analyse intrahousehold issue papers, and develop guiding principles and strategies for achieving household food and nutrition security for the vulnerable.

### Funding and support

The preparatory and implementation phases of this multicountry study have been supported mainly by **funds provided by the Government of Japan**. However, additional funds have been provided by:

- the Government of China for the study in China;
- the National Nutrition Institute for the study in Egypt;
- the Rockefeller Foundation, IFPRI, CIDA, IDRC, and UNICEF for the study in Ghana;
- GTZ for the study in Indonesia;
- UNICEF for the study in Myanmar; and;
- The South African Council for Scientific Development for the study in South Africa.

Additional funds are required to support the preparation and holding of a global technical consultation to develop guiding principles and policy and programme strategies for achieving household food and nutrition security for all in the 21st century.

### Significance

WHO considers ensuring household food and nutrition security a **basic human right**. Globally, there is enough food for everyone, but inequitable access is a glaring problem. An improved understanding of factors affecting household food and nutrition security, and development of guiding principles for incorporating them into national nutrition policies and programmes, will thus be significant for:

- improving nutritional well-being of the most nutritionally vulnerable groups, through enhanced access to an adequate social and care environment within the household;
- enhancing an understanding of women's reproductive, nurturing, educational, and economic roles, which are fundamental to the health and nutritional well-being of both the household and the entire community; and
- ensuring meaningful equity between men and women and encouraging equitable distribution of food and other resources within the household, among all its members.

#### 5.2.3 Systematic review of research on the optimal length of exclusive breastfeeding

To ensure that its infant-feeding recommendation continues to reflect the most up-to-date globally applicable scientific and epidemiological evidence,

WHO is currently undertaking a systematic review of the relevant scientific literature in accordance with the Cochrane Collaboration's criteria and framework. There are several advantages to using this internationally recognized approach.

For example, the use of explicit, systematic methods in reviews limits bias (systematic errors) and reduces random errors (simple mistakes), thus providing more reliable results upon which to draw conclusions and make decisions. Meta-analysis, the use of statistical methods to summarize the results of independent studies, can provide more precise estimates of the effects of interventions than those derived from the individual studies included in a review. Results will be submitted to the Cochrane Library for appraisal and inclusion in its database of systematic reviews.

The aim of the systematic review is to examine and draw conclusions from the published scientific literature on the optimal duration of exclusive breastfeeding. The main outcomes being looked at include infant growth, morbidity and mortality; breast-milk nutrient intake versus requirements; child development outcomes; and influence of environmental contamination. The systematic review will include a separate review of observational studies, which is to say that it will not be limited to randomized clinical trials. Once the systematic review is complete, it will be sent for external peer review by a number of experts. Following the peer review, a WHO scientific working group will be convened in Geneva to review the evidence and, on this basis, formulate its recommendation on the length of exclusive breastfeeding.

The tentative review timetable is as follows:

April–June 2000	Conduct literature search
July 2000	Review papers identified
August 2000	Initial summary of work achieved
October/November 2000	Data extraction and write-up
November 2000	Review terminated and sent to peer reviewers
January 2001	Reception of comments from peer reviewers
March 2001	Meeting of informal WHO scientific group

### 5.3 The South-East Asia Nutrition Research-cum-Action network

A good example of a **WHO-supported and coordinated** regional nutrition research network is the South-East Asia Nutrition Research-cum-Action Programme, launched in 1980. During its first decade of operations, WHO provided support for 41 research projects in eight countries. For the most part, these projects deal with the strengthening of national nutrition programmes.

**Building on early successes**, the South-East Asia Nutrition Research-cum-Action Network was established in 1990. It comprises government nutrition focal points and the Region's major nutrition research institutes. Member States, whose representatives meet annually, expect the Network to facilitate information gathering and dissemination; share expertise; provide technical assistance, training, fellowships, and equipment; and identify priority research issues, fund research projects, and collaborate in carrying out multicentre studies.

Representatives to the Network from **nine Member States**—Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, and Thailand—met in Jakarta (1996). They reviewed the wide range of nutrition research currently under way in participating countries, identified nine priority nutrition research issues of common concern, selected a number of priority issues for investigation by each country in the coming years, and developed proposals for regional multicentre nutrition research projects.

**The meeting focused on** the prevention, control and elimination of:

- iodine deficiency disorders;
- iron deficiency anaemia;
- vitamin A deficiency; and
- protein-energy malnutrition.

**Emphasis** has been upon community-based programmes with regional/country relevance.

The network emphasizes the following research areas and priorities:

- development and evaluation of practical nutrition indicators for community use;
- identification, analysis, and incorporation of micronutrient-rich foods into household meal patterns to maximize nutrient bioavailability;
- appropriate complementary foods for infants and young children at household and community levels;
- appropriate supplementary foods for pregnant and lactating women at household and community levels;

- effective communication for desirable behavioural changes (eating and hygiene practices) for improving nutritional status;
- development of a sustainable community-based nutrition intervention model;
- improvement of the nutritional status of adolescent girls;
- social marketing for IDD intervention with emphasis on iodized salt and iodine supplementation; and
- weekly iron supplementation vs. daily supplementation for vulnerable populations.

In February 1998, an **intercountry workshop on nutrition research implementation** in the context of the research agenda of the International Conference on Nutrition was organized in WHO's South-East Asia Regional Office. The workshop reviewed the many studies being undertaken by the Network's four major nutrition research institutes. These are the Institute of Nutrition, Mahidol University, Thailand; the National Institute of Nutrition, Hyderabad; MS University, Baroda; and the Nutrition Research and Development Centre, Bogor.

**Results of the workshop** included recommendations and plans for strengthening collaboration and ensuring that regional nutrition priorities are addressed.

## 5.4 The WHO global network of collaborating centres in nutrition

WHO's 27 world-renowned collaborating centres in nutrition (Figure 10) undertake a **wide range of research and training activities**. All are institutes or departments within larger institutions having recognized expertise and records of excellence in nutrition.

They are formally designated by the Director-General of WHO, through the respective national health authority, as part of an international network responsible for carrying out specialized nutrition activities in support of the WHO Nutrition Programme at all levels. WHO collaborating centres perform the following main **functions**:

- research, development, and application of appropriate technology for nutrition;
- training, including research training, in nutrition;
- collaborative nutrition research developed with or under WHO supervision, including planning, execution, monitoring and evaluation of research, and promoting the application of results; and

- coordination of activities carried out by several institutions in nutrition.

Most of the programmes which are carried out between WHO and collaborating centres are coordinated and supervised by the respective **WHO regional nutrition adviser**. A four-year **plan of action** is drawn up between each centre and WHO, usually at the regional office level. Nutrition research and training activities are undertaken accordingly.

A critical review of the role and function of collaborating centres has been undertaken globally as part of a wide-ranging **review of mechanisms** within WHO. The purposes of this review are the promotion and support of research, coordination between research policies and WHO programmes, and linkages with the scientific community.

Table 15 lists the technical areas for which the WHO collaborating centres are responsible, and Figure 10 shows country and regional distribution. The key features, expertise, and terms of reference of each of the 27 centres were presented in the directory of WHO collaborating centres in Nutrition (WHO/NHD/99.7).

TABLE 15  
**Main technical areas of concentration of WHO collaborating centres in nutrition**

Areas	Number of centres
Nutrition epidemiology/public health nutrition	4
Nutrition surveillance	2
Research methodology in nutrition (including behavioural science techniques)	9
Food and nutrition policy	6
Nutrition and human rights/equity	2
Nutrition education	10
Food habits/food consumption/dietary data	7
Food composition	1
Advanced training in nutrition	18
Micronutrients	5
Maternal and child nutrition	9
Breastfeeding/infant feeding	7
Mass catering	1
Obesity and other chronic diseases	7
Nutrition in the elderly	1
Nutrition in primary health care	4
Nutrition emergencies	2
Nutrition problems of migrants	1
Clinical nutrition	1
Nutrition and infection	1
Food technology	3
Food hygiene	2

FIGURE 10

**WHO Collaborating Centres in Nutrition**

Argentina	■ Centre for Studies on Infant Nutrition
Brazil	■ Departamento de Medicina Social, Faculdade de Medicina, Universidade Federal de Pelotas
Chile	■ Instituto de Nutrición y Tecnología de los Alimentos, Universidad de Chile
Cuba	■ Instituto de Nutrición e Higiene de los Alimentos
Denmark	■ Danish Catering Centre
Egypt	■ The Nutrition Institute
France	■ Laboratoire de Nutrition Tropicale, Centre IRD de Montpellier
Greece	■ Department of Nutrition and Biochemistry, Athens School of Public Health
India	■ National Institute of Nutrition, Indian Council of Medical Research
	■ Department of Foods and Nutrition, Faculty of Home Science, M.S. University of Baroda
Indonesia	■ Nutrition Research and Development Centre, National Institute for Health Research and Development
Iran (Islamic Republic of)	■ National Nutrition and Food Technology Research Institute
	■ National Lactation Management Centre, Ministry of Health and Medical Education
Italy	■ Unit of Human Nutrition, National Institute of Nutrition
Kazakhstan	■ Institute of Regional Problems of Nutrition
Netherlands	■ Division of Human Nutrition and Epidemiology, Department of Food Technology and Nutritional Sciences, Wageningen Agricultural University
Norway	■ Institute for Nutrition Research/School of Nutrition, University of Oslo
Peru	■ Instituto de Investigación Nutricional
Poland	■ National Food and Nutrition Institute
Sweden	■ Unit for Preventive Nutrition at the Karolinska Institute, Department of Biosciences at Novum
Thailand	■ Institute of Nutrition, Mahidol University
United Kingdom	■ The Rowett Research Institute, Boyd Orr Research Centre
	■ Centre for International Child Health, Institute of Child Health, University of London
United Republic of Tanzania	■ Tanzanian Food and Nutrition Centre
United States of America	■ Cornell Program in Maternal and Child Nutrition and Cornell Food & Nutrition Policy Program, Division of Nutritional Sciences, Cornell University
	■ Center for Human Nutrition, School of Hygiene and Public Health, The Johns Hopkins University
	■ Wellstart International

**References**

- 1 *Physical status: the use and interpretation of anthropometry*. Report of a WHO Expert Committee. TRS No. 854. Geneva, World Health Organization, 1995.
- 2 WHO Working Group on Infant Growth. An evaluation of infant growth. Geneva, World Health Organization, 1994.
- 3 *Physical status: the use and interpretation of anthropometry*, op. cit.
- 4 WHO Working Group on the Growth Reference Protocol and WHO Task Force on Methods for the Natural Regulations of Fertility. Growth patterns of breastfed infants in seven countries. *Acta Paediatrica*, 2000, 89: 215–222.

## **SECTION 6**

# **GLOBAL NUTRITION DATA BANKING**

- 6.1** Global Database on Child Growth and Malnutrition
- 6.2** Global Database on Iodine Deficiency Disorders
- 6.3** Global Database on Vitamin A Deficiency
- 6.4** Global Database on Iron Deficiency and Anaemia
- 6.5** Global Database on Breastfeeding
- 6.6** Global Database on Obesity and Body Mass Index (BMI) in Adults
- 6.7** Global Database on National Nutrition Policies and Programmes





### Building an evidence base for establishing priorities and charting progress

The Department of Nutrition for Health and Development currently **operates seven global nutrition data banks**. WHO is uniquely qualified to undertake this specialized activity in view of its recognized expertise and independence among Member States, the international community, specialized nutrition institutes, universities and professional bodies. The data banks cover:

- child growth and malnutrition;
- iodine deficiency disorders;
- vitamin A deficiency;
- iron deficiency and anaemia;
- breastfeeding;
- obesity and body mass index (BMI); and;
- national nutrition policies and programmes.

Member States, the international community, specialized nutrition institutes, universities, professional bodies, and individuals regularly make use of WHO's global nutrition data banks. **Information is supplied in two main ways:** in response to direct requests, and through WHO publications and documents, journal articles, and periodic reports.

Examples of the latter include progress reports by the Director-General to WHO's governing bodies, and contributions to WHO's annual *World Health Report* and the *Weekly Epidemiological Record*. There is a continual two-way flow of related information and data between WHO and its Member States. WHO also provides technical support for the establishment of national nutrition databases and nutrition surveillance schemes.

At the 25th session of the ACC/SCN in Oslo (1) (March–April 1998), participating agencies expressed their appreciation for WHO's nutrition data-banking activities. They encouraged WHO to continue updating the analysis of global and regional trends in all forms of malnutrition, and assessing progress towards achieving global nutrition goals for the year 2000 and beyond.

## 6.1 Global Database on Child Growth and Malnutrition

The **Global Database on Child Growth and Malnutrition** is a dynamic catalogue of representative population-based nutrition data that are collected and assessed in a standardized manner. Its primary focus is undernutrition among infants and children under 5 years of age computed on the basis of weight-for-age (underweight), weight-for-height (wasting), and height-for-age (stunting),

although information on the prevalence of overweight in children is also included.

The database currently covers about **510 million** children, or 95% of the total population of under-5-year-olds. These figures reflect only nationally representative surveys. Additional data are available for some countries from surveys conducted at regional, provincial, state, district, or local levels. The database also provides country trend analyses from 1980 onwards. Among the first WHO databases to be accessible via the World Wide Web (<http://www.who.int/nutgrowthdb>), its **importance** lies in its continual use by countries, international organizations and others as a means to:

- **characterize** overall nutritional status and variations by age, sex, and geographical area;
- **target** populations and sub-populations for interventions to meet the nutritional needs of specific groups;
- **evaluate** the impact of nutrition intervention programmes;
- **monitor** secular trends in nutritional status
- **train** and educate teams to undertake nutritional assessments; and
- **increase** awareness of nutritional problems, and define policies and promote programmes to resolve them.

**The scope** of the database includes global nutritional status (wasting, stunting, underweight, and overweight) in children under 5 years of age. Present coverage is of over 95% of the world's population 0–5 years.

**Primary focus** is on the reporting of all available data, disaggregated by sex, age groups, urban/rural residence, and administrative regions by country, global and regional summary analyses, and trend analysis from 1980 onwards. Its importance lies in the provision of essential baseline and trend data for decision-makers, health workers, and researchers to promote healthy growth and development in children.

The Global Database on Child Growth and Malnutrition provides decision-makers and health workers alike with **baseline information**. This information takes the forms of maps, tables, graphs, and data in electronic formats, which are needed to plan, implement, and monitor and evaluate intervention programmes aimed at promoting healthy child growth, nutrition, and development.

**Global database on child growth charts.** NHD is developing an inventory of growth charts used worldwide for the assessment of the nutritional status of infants and young children. In addition, information will be collected on the prob-



lems that health workers, at all levels, encounter with the utilization of child growth charts.

A request for national child growth charts, together with a questionnaire, have been sent to more than **200 countries and territories**. To date, the response has been enormous (75%).

### **Micronutrient databases: the Micronutrient Deficiency Information System (MDIS)**

Part of the **mandate of WHO** is to develop and maintain global databases for monitoring, evaluating, and reporting on the world's major diseases. In addition to providing a means to track the severity and distribution of specific health problems, the continual collection and collation of data over time also enables governments to gauge the effectiveness of their programmes and progress towards achieving national, regional and global targets. The micronutrient databases can serve as powerful advocacy tools, by providing evidence for governments to fund and implement programmes to address micronutrient deficiencies.

The NHD Micronutrient Deficiency Information System, **established in 1991**, contains three sets of data, one each for iodine, vitamin A, and iron. These databanks are fed from several information sources: country survey reports, data from questionnaires sent out by WHO regional offices or headquarters, and literature searches carried out at WHO headquarters. All three databases are being re-designed to include additional information and to enable Internet/Web access. The collection of sound national data is an essential part of this process and NHD is actively encouraging the strengthening of country monitoring systems.

## **6.2 The Global Database on Iodine Deficiency Disorders (IDD)**

**This data base is being modified** to include new data on urinary iodine excretion (UIE) in addition to the more familiar information on total goitre rates (TGR). Data are now expressed by age and sex, and population figures now include those at-risk (living in areas where the TGR is above 5%). National surveys sent out in 1998 asked for information on programmatic aspects of IDD initiatives, such as the existence of a plan of action, legislation related to iodine, and techniques of monitoring the populations and/or the quality of iodized salt. The results of this survey were reported to the Fifty-second World Health Assembly (1999).

## **6.3 The Global Database on Vitamin A Deficiency (VAD)**

The VAD Global Database tracks the magnitude and distribution of VAD in preschool and school-aged children worldwide. Containing both clinical and biochemical parameters, the database provides estimates of overt and subclinical VAD, and of populations at risk. The best indicator for VAD is the level of serum retinol and WHO encourages its Member States, wherever possible, to carry out VAD surveys including retinol measurement. For many developing countries, however, carrying out field surveys of serum retinol is very difficult if not impossible. Thus, WHO is also focusing attention on the development of more sensitive and reliable field tests so that more realistic sub-clinical measurements can be made.

## **6.4 The Global Database on Iron Deficiency and Anaemia (IDA)**

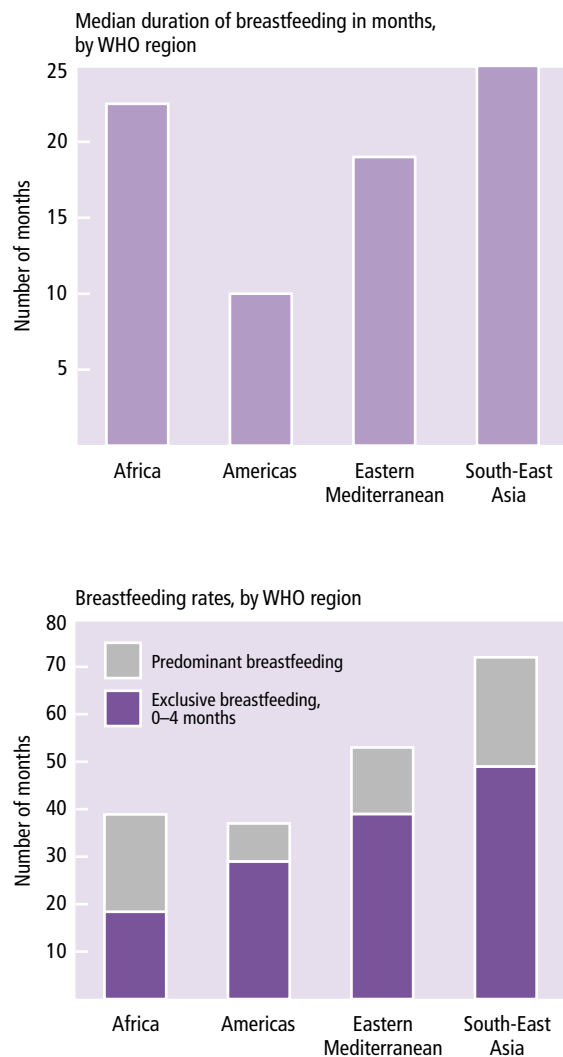
The Global Database on Iron Deficiency and Anaemia is maintained jointly by NHD and the Maternal and Safe Motherhood Programme. It has compiled information, based mainly on studies of blood haemoglobin concentration, on prevalence rates of anaemia in pregnant and non-pregnant women worldwide; and on the prevalence of anaemia among infants, preschool-age and school-age children, and adolescents in 85 countries.

At present, the usefulness of this database is limited because the data are sparse and only recently has the importance of other causative factors been recognized. The redesigned database will add information on the prevalence of malaria, hookworm and other important epidemiological determinants. Additionally, WHO is advocating the development of more practical and sensitive field methods for measuring anaemia and iron deficiency so that complete and accurate data can be more widely collected.

## **6.5 Global Data Bank on Breastfeeding**

The WHO Global Data Bank on Breastfeeding presently covers **94 countries** and **65%** of the world's infant population (<12 months). Based on the latest data, it is estimated that 35% of these infants are exclusively breastfed (2) between 0–4 months of age.

FIGURE 11  
Breastfeeding (2) duration and rates



The Bank is maintained and managed in keeping with internationally accepted breastfeeding definitions and indicators. It **pools information** mainly from national and regional surveys, and studies dealing specifically with breastfeeding prevalence and duration. The bank's household and health facility indicators have been used to monitor the progress of the Baby-friendly Hospital Initiative and achievements towards the WHO/UNICEF end-of-decade goals for breastfeeding prevalence and duration. The **aim is to achieve worldwide coverage** in order to enable comparisons of representative data, assessment of breastfeeding trends and practices as a basis for future action and evaluation of progress. NHD periodically publishes reports on global breastfeeding trends.

The Bank's system has recently been revised, upgraded and migrated to Access (WHO's standard for small databases) and put on the World Wide Web. Following an initial testing period of six months, the data bank will then be put on WHO's Website.

### Highlights from the Global Data Bank on Breastfeeding

Rates for exclusive breastfeeding under 4 months of age are **very low** in a number of countries in the **African Region**, e.g. Central African Republic (4% in 1995), Niger (4% in 1992), Nigeria (2% in 1992), and Senegal (7% in 1993). In other countries, rates for exclusive breastfeeding, though low, have shown a gradual increase in recent years, e.g. Benin (13% in 1996 and 16% in 1997), Mali (8% in 1987 and 12% in 1996), Zambia (13% in 1992 and 23% in 1996), and Zimbabwe (12% in 1988 and 17% in 1994). The increase in exclusive breastfeeding rates is due mainly to breastfeeding campaigns, and additional Baby-friendly Hospitals and trained breastfeeding counsellors.

In the **South-East Asia** Region, the ever-breastfed rate has **increased somewhat** in recent years, for example in Thailand (90% in 1987 and 99% in 1993). The exclusive breastfeeding rate, though low, has increased from 0.2% (1993) to 4% (1996).

Despite breastfeeding's numerous recognized advantages over artificial feeding even in industrialized countries, breastfeeding rates are **typically low**, and **only slowly improving**, in the **European Region**. This is the situation in France, Italy, Netherlands, Spain, Switzerland, and the United Kingdom. Sweden tells a **very different story**: ever-breastfed rates (after 1990) are 98%. Recent data show that Armenia has increased its exclusive breastfeeding rate under 4 months from 0.7% in 1993 to 20.8% in 1997; Poland has increased from 1.5% in 1988 to 17% in 1995; and Sweden has increased from 55% in 1992 to 61% in 1993.

In the **Eastern Mediterranean** Region, the exclusive breastfeeding rate in some countries is **high** compared to countries in other regions. Egypt and Saudi Arabia have an exclusive breastfeeding rate (under 4 months of age) of 68% (1995) and 55% (1991), respectively. Pakistan shows an increase in exclusive breastfeeding under 4 months from 12% (1988) to 25% (1992).

Data for the **Americas** show that ever-breastfed rates are high in some countries (Chile 97% in 1993, Colombia 95% in 1995, and Ecuador 96% in 1994). However, the rates of exclusive breastfeeding under 4 months, though high compared to

societies in the other regions, show a **slight decrease** (Bolivia, 59% in 1989 and 53% in 1994; Colombia, 19% in 1993 and 16% in 1995; and Dominican Republic 14% in 1986 and 10% in 1991).

In some countries where the advantages of breastfeeding have been widely publicized and where the Baby-friendly Hospital Initiative has begun in earnest, breastfeeding rates are actually **increasing**, e.g. Australia, Canada, China, and USA.

The exclusive breastfeeding rate under four months of age, predominant breastfeeding rate, and median duration of breastfeeding for the African Region, the Region of the Americas, and the South-East Asia and Eastern Mediterranean Regions are presented in Figure 11.

## 6.6 Global Database on Obesity and Body Mass Index (BMI) in Adults

The Global Database on Obesity and Body Mass Index in Adults was **established in 1996** and is **steadily increasing in size and coverage**. The aim is to provide an up-to-date instrument—thus far the only one of its kind—for determining the worldwide magnitude and distribution of underweight, overweight, and obesity in adult populations.

Survey data are currently available from **96 countries**. Population rates or mean BMIs are classified according to recommended BMI cut-off points. Thus far, 84 countries covering 79.5% of the adult population worldwide (see Table 16 and Figures 12 and 13) have either a national mean

FIGURE 12  
Global prevalence of underweight and obesity in adults for year 2000, by level of development

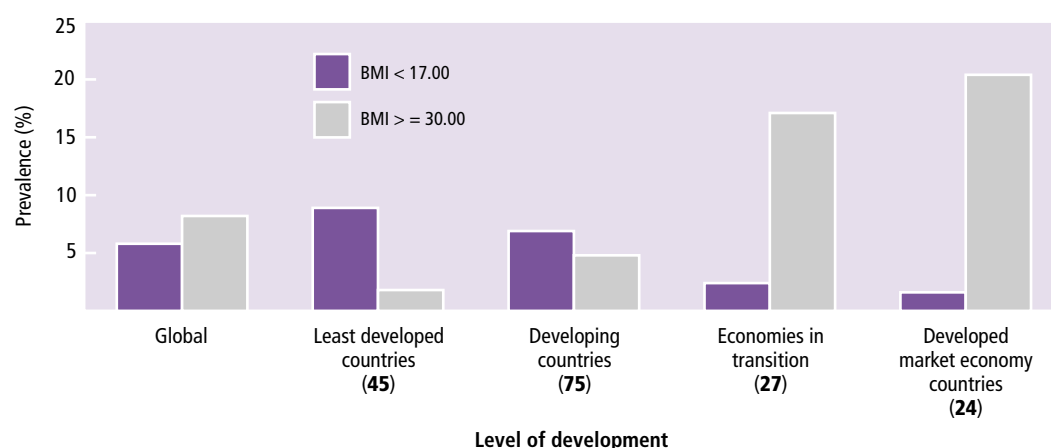


FIGURE 13  
Global population affected by underweight and obesity in adults for year 2000, by level of development

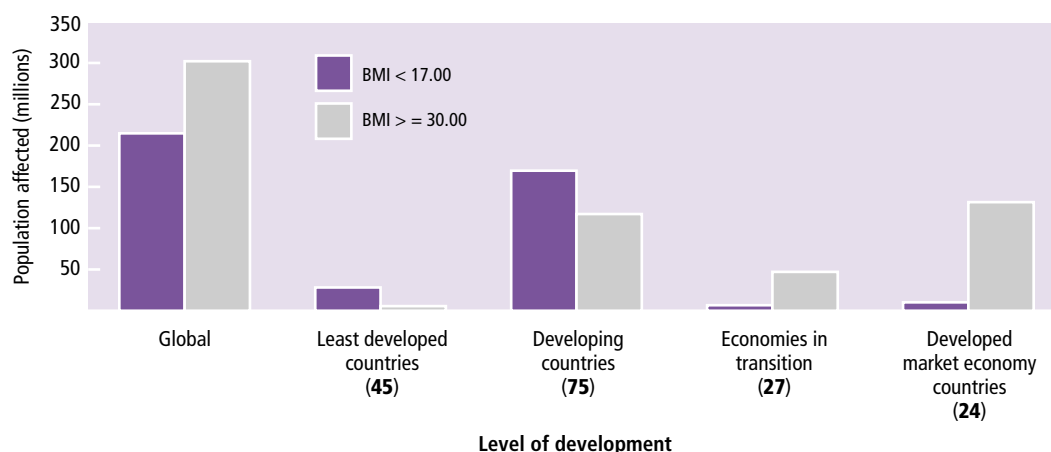


TABLE 16  
**Progress in coverage of the WHO Global Database on Obesity and Body Mass Index in Adults**

Time frame	1997–1998	1998–1999	1999–2000
Number of countries having national data for adults	61	79	84
Adult population covered by national data (%)	70.4	78.9	79.5

BMI or cut-off data and an additional 12 countries have regional or local data.

As the database has developed, a cubic regression analysis has enabled estimates of prevalence above or below the cut-off points to be made with reasonable accuracy from mean BMI data. For countries for which no mean BMI data are available, estimates have been made using data from a proxy country, i.e. a neighbour having a similar socioeconomic profile.

**Database output** includes maps, tables, graphs, and electronic data. These instruments indicate trends in both overweight and underweight, by sex or combined, by WHO region, UN region, and level of development. Based on available data, obesity and undernutrition coexist in many countries. Therefore, it is planned to undertake an analysis to establish a series of dynamic models according to sex, age-group and socioeconomic status.

Obesity is significant as a risk factor for serious noncommunicable diseases, including cardiovascular disease, hypertension and stroke, diabetes mellitus (NIDDM), and various forms of cancer. Accordingly, the database serves to alert Member States and the international community to the true nature of the rapidly rising prevalence rates and numbers of obese adults worldwide.

## 6.7 Global Database on National Nutrition Policies and Programmes

The Global Database on National Nutrition Policies and Programmes was established in 1995 initially to monitor and evaluate the progress in implementing the World Declaration and Plan of Action for Nutrition. However, it has been further developed to monitor country progress in developing, strengthening and implementing national nutrition plans, policies and programmes, including multi-sectoral actions, development of dietary guidelines, undertaking of nutrition surveys, de-

mographic, and epidemiological data. **Included** in the database are:

- outcomes of a 1994 evaluation on country progress in implementing the World Declaration and Plan of Action for Nutrition (3);
- status of the development and implementation of national food and nutrition policies and plans since 1994;
- summary of available national food and nutrition policies and plans, including priority goals and strategies and planned programme activities, together with estimated budget, where available;
- technical and financial support provided to Member States by WHO and other agencies;
- demographic data relating to health and nutrition for each country;
- information on multisectoral action, development of dietary guidelines, and nutrition surveys;
- trends in WHO's global and regional nutrition budget since 1988; and
- information on regional activities, where applicable.

The data and information are derived mainly from government policies and plans, such as national plans of action for nutrition, national food and nutrition policies, national health policies, and other food and nutrition related policies, where applicable. Data have also been obtained from country reports prepared for the International Conference on Nutrition in 1992, the World Food Summit in 1996 and various regional follow-up meetings and consultations. Additional data and information are also provided periodically by each WHO regional office. It is envisaged that the regional review meetings planned for 2000 for the African Region, the Region of the Americas, and the Eastern Mediterranean Region will generate additional new data and information for countries in those respective regions.

The Section on Developing and Implementing National Nutrition Policies and Plans (Section 4.1 in this report) was prepared using the data and information extracted from this database. Furthermore, currently a global review and comparative analysis of national nutrition policies, and plans of action is being undertaken using the data and information available in this database to evaluate progress and country experiences. This review will look at priority nutrition issues identified by countries, key elements for developing and implementing effective and sustainable nutrition policies and programmes, lessons learned, and the way forward, including further actions and support required.

## References

- 1 The United Nations Administrative Committee on Coordination/Sub-Committee on Nutrition is the focal point for harmonizing the policies and activities in nutrition of 16 agencies of the United Nations system, including WHO. Annual meetings are attended by representatives of these agencies and approximately 20 bilateral and NGO observers.
- 2 “Exclusive” breastfeeding is defined as no other food or drink, not even water, except breast milk for at least 4 and if possible 6 months of life, but allows the infant to receive drops and syrups (vitamins, minerals and medicines). “Predominant” breastfeeding means that the infant’s predominant source of nourishment has been breast milk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc), fruit juice, or ORS solution.
- 3 These data were used as the basis for preparing the WHO Progress Report, *Nutrition: Highlights of recent activities in the context of the World Declaration and Plan of Action for Nutrition* (WHO/NUT/95.2) and the Joint FAO/WHO Progress Report on the Implementation of the ICN World Declaration and Plan of Action for Nutrition, Geneva, World Health Organization, and Rome, Food and Agriculture Organization, 1996, which was submitted through ECOSOC to the UN General Assembly.

# ANNEXES





## ANNEX 1

**Staff, Nutrition for Health and Development:  
headquarters and regional offices****Headquarters (Geneva)**

Mr J. Akaré, Technical Officer  
 Ms H. Allen, Technical Officer  
 Ms M. Andersson, Intern  
 Ms A. Bailey, Secretary  
 Ms P. Bhalla, APW  
 Dr B. de Benoist, Medical Officer  
 Ms M. Blössner, Technical Officer  
 Ms R. Bourne, Administrative Assistant  
 Dr G.A. Clugston, Director  
 Dr R. Hempstead, APW  
 Ms S. Horsfall, Technical Assistant  
 Ms R. Imperial, Technical Officer  
 Mr Y. Ling, STP  
 Ms A. Manus, Administrative Assistant  
 Ms C. Melin-Nerfin, Secretary  
 Dr M. Mokbel Genequand, Medical Officer  
 Ms J-A. Muriel, APW  
 Ms T. Mutru, Technical Officer  
 Ms C. Nishida, Technical Officer  
 Dr M. de Onis, Medical Officer  
 Dr A. Onyango, Technical Officer  
 Ms P. Robertson, Secretary  
 Ms A. Ryan-Rohrich, Secretary  
 Ms R. Saadeh, Technical Officer  
 Ms P. Scarrott, Secretary  
 Ms Z. Weise Prinzo, Technical Officer  
 Ms T. Wijnhoven, Associate Professional Officer  
 Ms J. Wyllie, Secretary

**Regional Office for Africa (Harare)**

Dr K. Kellou, Regional Officer, Nutrition a.i.  
 Ms M.J.K. Pewudie, Secretary

**Regional Office for the Americas  
(Washington, DC)**

Dr H. Delgado, Director, INCAP  
 Mrs E. Bennett, Coordinator's Secretary, AMRO  
 Dr W. Freire, Programme Coordinator, PAHO/  
 HPP/HPN  
 Dr F. Henry, Director, CFNI

Mrs S. de Jiménez, Director's Secretary, INCAP  
 Ms S. Kim, STC, AMRO  
 Ms N. León, STC, AMRO  
 Dr C. Lutter, Regional Adviser in Food and Nu-  
 trition, PAHO/HPP/HPN  
 Mrs M. Tappin-Lee, Director's Secretary, CFNI  
 Mrs J. Valencia, Office Assistant, AMRO

**South-East Asia Regional Office (New  
Delhi)**

Dr S. Khanum, Regional Adviser, Nutrition for  
 Health and Development and Food Safety  
 (RA/NHD)  
 Mr O. Prakash Kataria, Secretary, NUT

**Eastern Mediterranean Regional Office  
(Alexandria)**

Dr K Bagchi, STP/Nutrition, NFS  
 Ms S. El Raey, Secretary, NFS  
 Ms Samah Abdel Aziz, Secretary, NFS  
 Dr A. Verster, Director, Health Protection and  
 Promotion (DHP) and  
 Regional Advisor, Nutrition, Food Security and  
 Safety (A/RA/NFS)

**Regional Office for Europe (Copenhagen)**

Ms S. Charnley, Programme Assistant, NIF  
 Ms P. Johnson, Secretary, NIF  
 Ms N. Redman, Secretary, NIF  
 Dr A. Robertson, Regional Adviser, a.i., Nutri-  
 tion Policy, Infant feeding and Food Security  
 (NIF) and Food Security Programme (RA/NIF  
 a.i.)

**Western Pacific Regional Office (Manila)**

Dr T. Cavalli-Sforza, Regional Adviser, Nutrition  
 (RA/NUT)  
 Ms D. Bosch, APO, NUT  
 Ms N. Gochuico, Secretary, NUT

## ANNEX 2

### Collaborative linkages of the Department of Nutrition for Health and Development

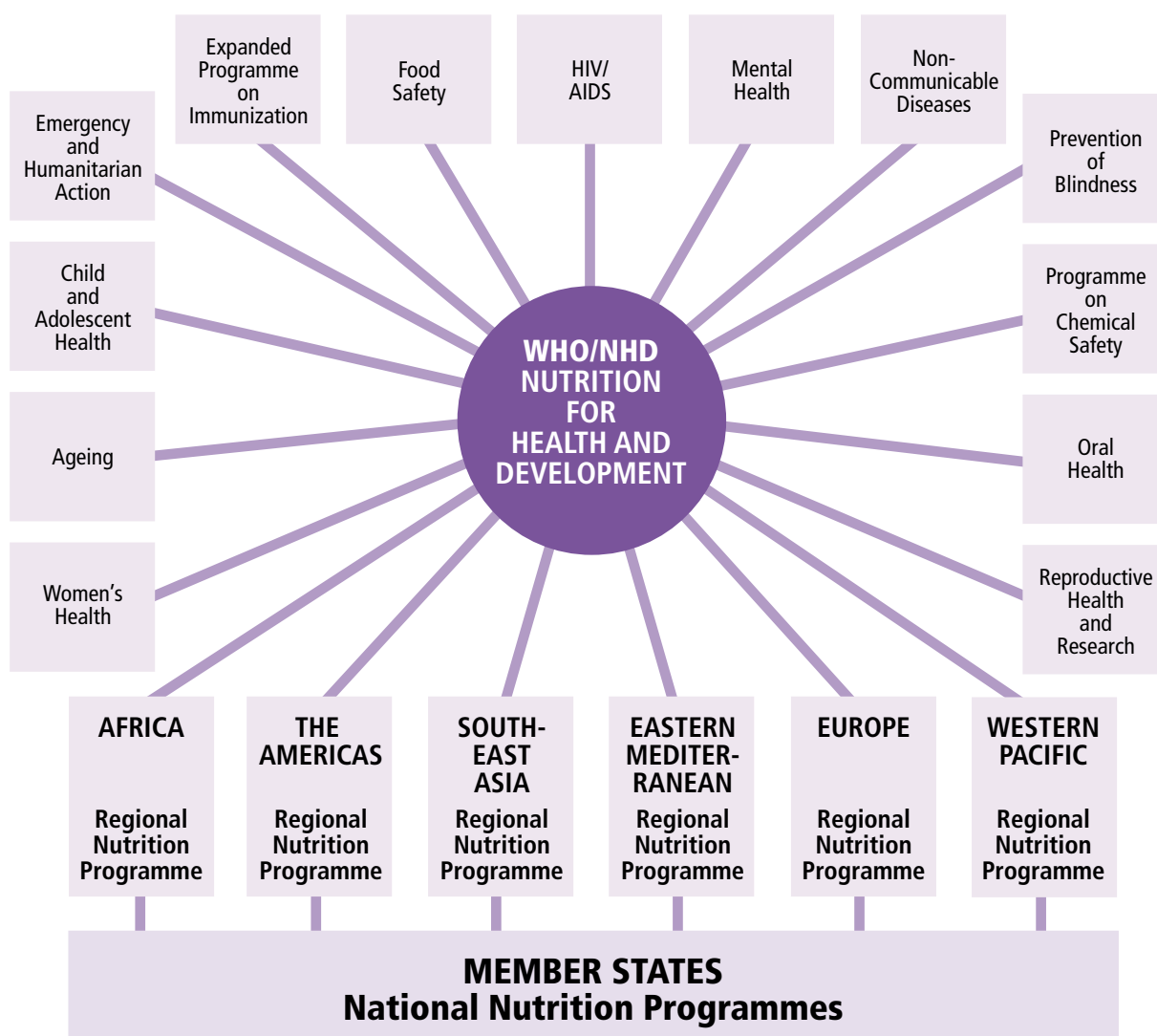
#### 1. Within NHD: the six regional nutrition programmes and headquarters

WHO supports national nutrition programmes in most Member States—particularly in the least-developed and developing countries—through the collaborative support provided by the Organization’s **six regional nutrition programmes**. Each regional nutrition programme has its own objec-

tives, country and regional activities, and budget, all of which are designed to deal with the specific nutrition priorities as defined by the Member States of the region.

The headquarters Department of Nutrition for Health and Development, with its global and interregional activities and perspective, functions simultaneously on **two fronts**. It provides techni-

FIGURE 14  
Inter-programmatic collaborative linkages



cal and financial support to and through the regional nutrition programmes, and it handles priority scientific and normative issues of global importance.

The main focus of WHO's collaborative support on behalf of Member States remains **capacity building**, particularly in development of the skill mix required to successfully develop and implement national nutrition policies, plans of action, and programmes. **Special emphasis** is given to meeting the needs of the least-developed and developing countries, in accordance with the mutual commitment to implementing the World Declaration and Plan of Action for Nutrition.

**Inter-programmatic collaborative linkages** are the norm both within WHO headquarters and in the regional offices. Through these and other resources, NHD provides technical and financial support to and through the **regional nutritional programmes**.

## 2. Within WHO: inter-programmatic linkages

Inter-programmatic collaboration and linkages, concerning more than a dozen programme areas, are the norm in both the regional offices and WHO headquarters. For example, the following programmes address common topical areas:

- **Ageing** Nutritional status, dietary deficiencies, obesity, osteoporosis
- **Child and Adolescent Health** Malnutrition, infant feeding, growth, vitamin A, diet, obesity, nutritional status, iron
- **Emergency and Humanitarian Action** Nutrition/malnutrition in emergencies, rations, specific nutrient deficiencies, infant feeding
- **Expanded Programme on Immunization** Vitamin A and iodine supplementation using immunization programmes
- **Food Safety** Nutrition and dietary issues related to the Codex Alimentarius Commission and the World Trade Organization, fortification, food, and nutrition education
- **Mental Health** Iodine deficiency disorders
- **Noncommunicable Diseases** Obesity and other diet-related NCDs, carbohydrate and fat intakes
- **Prevention of Blindness** Vitamin A deficiency blindness in children

- **Programme for Chemical Safety** Trace elements in human nutrition, food additives
- **Oral Health** Fluoride intake, sugars in diet, infant formula, pacifiers and dentition
- **Reproductive Health and Research** HIV and infant feeding, lactational amenorrhoea, breastfeeding, breastfeeding and fertility, safe-motherhood, maternal nutrition, iron, folate, iodine
- **Women's Health** Maternal nutrition, iodine deficiency, iron deficiency anaemia, gender issues

## 3. Collaboration within the United Nations system and with other international and nongovernmental organizations

Because of the fundamental role that nutrition plays in health, agriculture, and development, WHO collaborates closely with many other organizations at the global, regional and national levels. These include international organizations, multi-lateral and bilateral agencies, nongovernmental organizations, international scientific consultative groups, and international research and training institutions. Among these organizations are the following:

TABLE 17

**Collaboration with international and nongovernmental organizations**

<b>United Nations Administrative Committee on Coordination</b>	<b>United Nations specialized agencies</b>	<b>Other agencies of the United Nations system</b>	<b>International scientific consultative groups</b>	<b>International research and training institutions</b>
<ul style="list-style-type: none"> <li>■ Sub-Committee on Nutrition: includes 16 UN organizations with an interest in nutrition, some 15 bilateral development agencies, and NGO observers</li> </ul>	<ul style="list-style-type: none"> <li>■ FAO</li> <li>■ UNESCO</li> <li>■ ILO</li> <li>■ IFAD</li> <li>■ IAEA</li> <li>■ World Bank</li> </ul>	<ul style="list-style-type: none"> <li>■ UNICEF</li> <li>■ UNDP</li> <li>■ UNHCR</li> <li>■ UNFPA</li> <li>■ UNU</li> <li>■ WFP</li> </ul>	<ul style="list-style-type: none"> <li>■ ICCIDD</li> <li>■ IVACG</li> <li>■ INACG</li> <li>■ IUNS</li> <li>■ IDECG</li> <li>■ IFPRI</li> <li>■ MI (Micronutrient initiative)</li> <li>■ PAMM (Programme Against Micronutrient Malnutrition)</li> </ul>	<ul style="list-style-type: none"> <li>■ See section 6.3 on WHO's network of collaborating centres in nutrition</li> </ul>

## ANNEX 3

## Selected recent publications and documents

**Nutritional assessment monitoring**

- Working Group on Infant Growth. *An evaluation of infant growth*; (document WHO/NUT/94.8).
- *Physical status: the use and interpretation of anthropometry*. Report of a WHO Expert Committee (WHO Technical Report Series, No. 854).
- De Onis M et al. The worldwide magnitude of protein-energy malnutrition: an overview from the WHO Global Database on Child Growth. *Bulletin of the World Health Organization*, 1995, 71(6):703–712.
- WHO Working Group on Infant Growth. An evaluation of infant growth: the use and interpretation of anthropometry in infants. *Bulletin of the World Health Organization*, 1995, 73(2):165–174.
- *WHO Global Database on Child Growth and Malnutrition* (document WHO/NUT/97.4). Internet: <http://www.who.int/nutgrowthdb>
- *Management of severe malnutrition: a manual for physicians and other senior health workers*. Geneva, World Health Organization, 1999.

**Micronutrient malnutrition**

- *Atelier OMS inter pays sur les carences en micronutriments pour les coordonnateurs nationaux de programmes, Bamako, Mali, 27–29 mai 1997*. OMS, Bureau Régional pour l’Afrique (document AFRO/NUT/97.3).
- *Trace elements in human nutrition and health*. Geneva, World Health Organization, 1996.

**Iodine deficiency disorders**

- *WHO intercountry workshop for national programme managers. Micronutrient deficiencies in Africa*. WHO, Regional Office for Africa in collaboration with ICCIDD (document WHO/AFRO/NUT/98.2).
- *Elimination of iodine deficiency disorders (IDD) in central and eastern Europe, the Commonwealth of Independent States, and the Baltic States*. WHO, Regional Office for Europe (document WHO/EURO/NUT/98.1).
- *Elimination of iodine deficiency disorders in South-East Asia*. WHO, Regional Office for South-East Asia. Document SEA/NUT/138, 1997.

- Recommended normative values for thyroid volume in children aged 6–15 years. *Bulletin of the World Health Organization*, 1997, 75(2):95–97.
- The safe use of iodized oil during pregnancy. *Bulletin of the World Health Organization*, 1996, 74(1):1–3.
- *Review of findings from a 7-country study in Africa on levels of salt iodization in relation to iodine deficiency disorders, including iodine-induced hyperthyroidism*. Joint WHO/UNICEF/ICCIDD Consultation. WHO, Regional Office for Africa (document WHO/AFRO/NUT/97.2).
- *Recommended iodine levels in salt and guidelines for monitoring their adequacy and effectiveness* (document WHO/NUT/96.13).
- *Intercountry workshop on iodized salt for small producers in Western Africa, 20–23 February 1995*. Journal report available in English and French. WHO/AFRO 1998.
- *Indicators for assessing iodine deficiency disorders and their control through salt iodization* (document WHO/NUT/94.6 [under revision]).
- *Progress towards the elimination of Iodine Deficiency Disorders (IDD)* (document WHO/NHD/99.4 [in preparation]).
- *Global prevalence of iodine deficiency disorders*. Micronutrient Deficiency Information System, MDIS Working Paper No. 2 (under revision).
- WHO, International Council for Control of Iodine Deficiency Disorders. *Hyperthyroidism and other thyroid disorders. A practical handbook for recognition and management* (document WHO/AFRO/NUT/99.1). Harare, World Health Organization, Regional Office for Africa, 1998.
- Houston R et al. (ed.). *Assessing country progress in universal salt iodization programs*. Iodized salt program assessment tool (ISPAT). Ottawa, Micronutrient Initiative, 1999.

**Vitamin A deficiency**

- *Vitamin A supplements: a guide to their use in the treatment and prevention of vitamin A deficiency and xerophthalmia*. Second edition. Geneva, World Health Organization, 1997.
- *Global prevalence of vitamin A deficiency*. Micronutrient Deficiency Information System, MDIS Working Paper No. 2.

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