

# Introduction to Public Health Nutrition

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Adapted from: Krause's Food & Nutrition Therapy

# Nutrition: definition

“The science/study of nutrients that come from **food**, their action, interaction, and balance in relation to health and disease; and the process by which the organism (body) ingests, digests, absorbs, transports, utilizes and excretes food substances.”

# Public Health

Public Health is defined as “the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society” (Acheson, 1988; WHO).

<sup>b</sup>

**The main mission of public health is "to assure conditions in which people can be healthy" (Institute of Medicine, The Future of Public Health).**

# Public Health and Nutrition

- ▶ **Since nutrition is an essential aspect of the conditions in which people can be healthy, public health nutrition is part of the public health system.**



# Nutrition

# Assessing Eating Behaviors

- ▶ **What drives people to eat?**
  - ▶ **Hunger**
  - ▶ **Appetite**
  - ▶ **Cultural and social meaning of food**
  - ▶ **Habit or custom**
  - ▶ **Emotional Comfort**
  - ▶ **Convenience and advertising**
  - ▶ **Nutritional value**
  - ▶ **Social interactions**

# Background definitions

- ▶ **Nutrients**: “Chemical substances in food that nourish the body by providing energy, building materials, and factors to regulate needed chemical reactions.”
- ▶ **Essential nutrients**: Must be provided by food because the body does not produce them in sufficient quantities or can not make them at all.
- ▶ **Nonessential nutrients**: Healthy, well-nourished bodies can make them in sufficient quantities to satisfy their needs.

# Essential Nutrients

**Nutrients are essential to the human diet** if they meet two characteristics.

- ▶ First, omitting the nutrient from the diet leads to a **nutritional deficiency** and a decline in some aspect of health.
- ▶ Second, if the omitted nutrient is put back into the diet, the symptoms of nutritional deficiency will decline and the individual will return to normal, barring any permanent damage caused by its absence.



## Essential Nutrients cont'd:

The essential nutrients are:

- Some forms of carbohydrate (glucose)
- Certain constituents of fat [the essential fatty acids: linoleic acid (omega-6) and linolenic acid (omega-3)]
- Certain constituents of protein (the essential amino acids such as lysine, histidine, etc)
- 15 vitamins
- About 25 minerals
- Water

# Functions of nutrients in food:

- a. Provide energy sources**
- b. Build tissue**
- c. Regulate metabolic processes**

# Six categories of nutrients

- 1. Carbohydrates:** contain carbon, hydrogen, and oxygen combined in small molecules called sugars and large molecules represented mainly by starch.
- 2. Lipids (fats and oils):** contain carbon, hydrogen, and oxygen as do carbohydrates, but the amount of oxygen is much less. Triglyceride is the main form of food fat.
- 3. Proteins:** contain carbon, hydrogen, and oxygen, plus nitrogen and sometimes sulfur atoms arranged in small compounds called amino acids. Chains of amino acids make up dietary proteins.

## Six categories of nutrients (cont'd):

- 4. Vitamins:** are organic compounds that serve to catalyze or support a number of biochemical reactions in the body.
- 5. Minerals:** are inorganic elements or compounds that play roles in metabolic reactions and serve as structural components in body tissues such as bone.
- 6. Water:** is vital to the body as a solvent and lubricant and as a medium for transporting nutrients and waste.

# Nutrients are classified into :

- ▶ **A. Macronutrients (carbohydrates, fats, and proteins).**

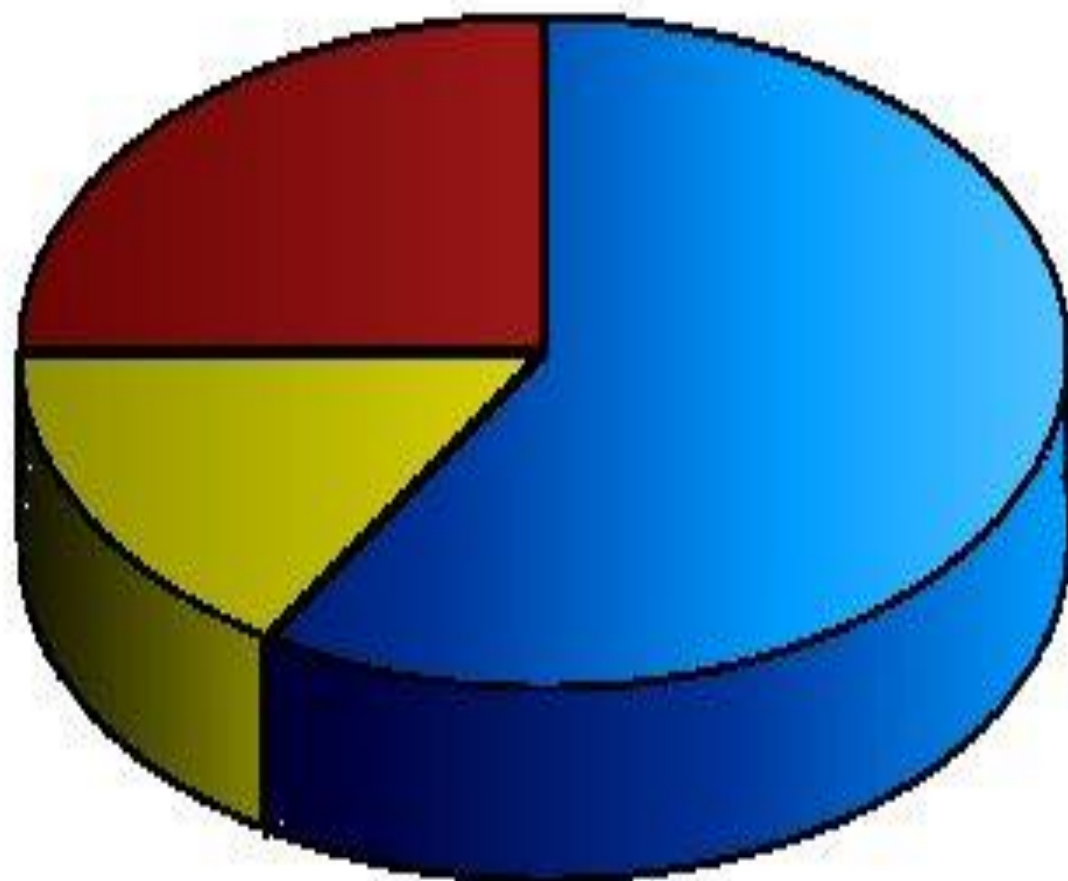
**Provide calories for energy**

**Needed in large quantities**

- ▶ **B. Micronutrients (vitamins, minerals, and water).**

**Needed in smaller amounts**

# Macronutrient Breakdown



Carbohydrates: 55-65%

Fat: 25-30%

Protein: 10-15%

# General FACTORS AFFECTING NUTRITION

- ▶ Age and gender
- ▶ Lifestyle
- ▶ Food habits
- ▶ Ethnicity, Culture, and Religious Practices
- ▶ Social Interaction
- ▶ Availability of food
- ▶ Peer pressures
- ▶ Economy

# Social Determinants (factors) of Nutrition

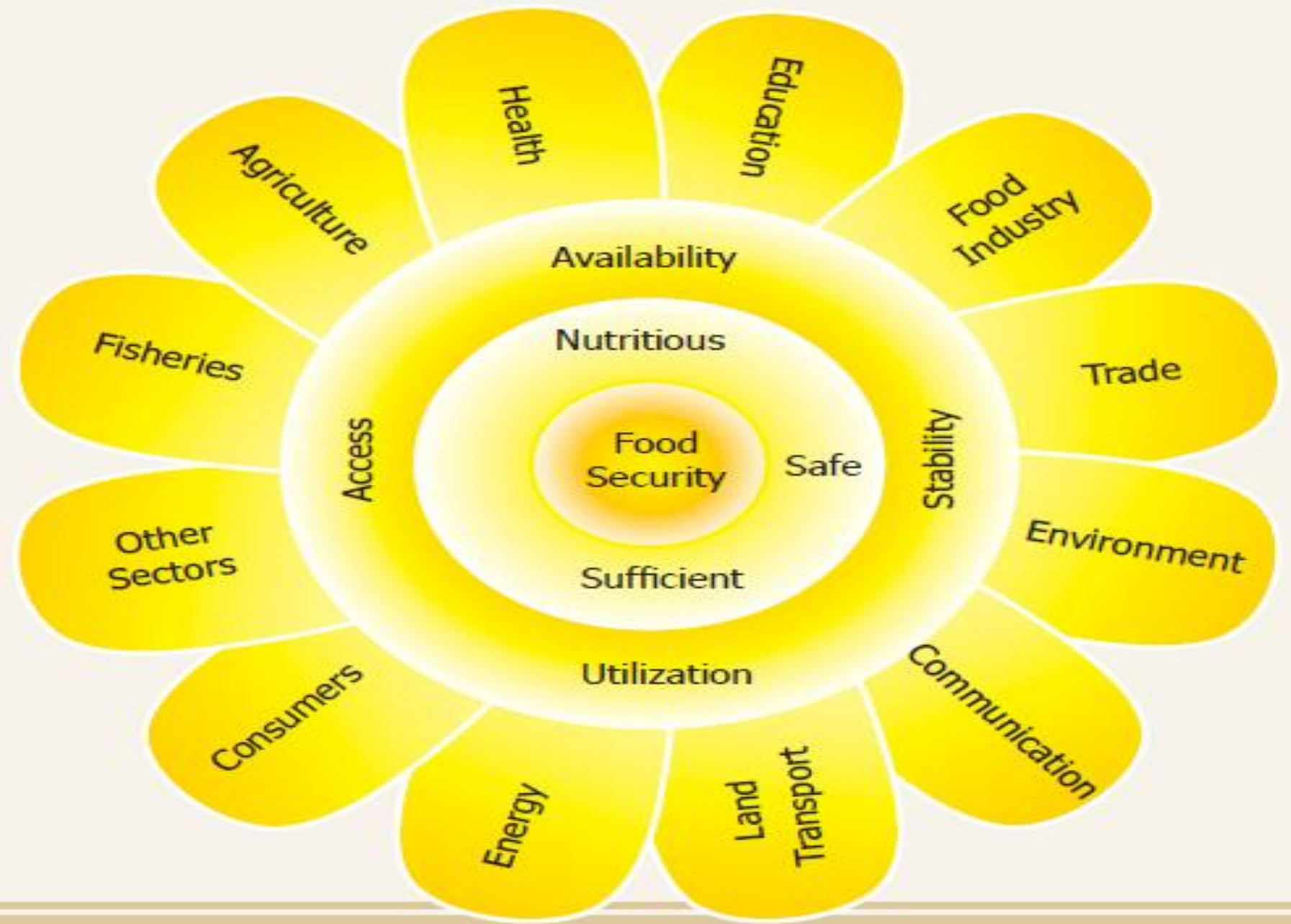
Demographic characteristics of those with a more healthful diet vary with the nutrient or food studied. However, most people need to improve some aspects of their diet.

Social factors thought to influence diet include:

- ▶ Knowledge and attitudes
- ▶ Skills
- ▶ Social support
- ▶ Societal and cultural norms
- ▶ Food and agricultural policies
- ▶ Food assistance programs
- ▶ Economic price systems



**Figure 1: Conceptual model of food security in the Pacific**



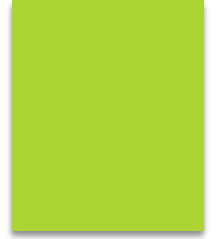
# Public health nutrition

- ❑ **Public Health Nutrition strives to improve or maintain optimum nutritional health of the whole population and high risk or vulnerable subgroups within the population.**
- ❑ **Public Health uses multiple, coordinated strategies to reach and influence the community, and organizations and individuals that make up the community.... with leadership provided by the government.**

# Public health nutrition

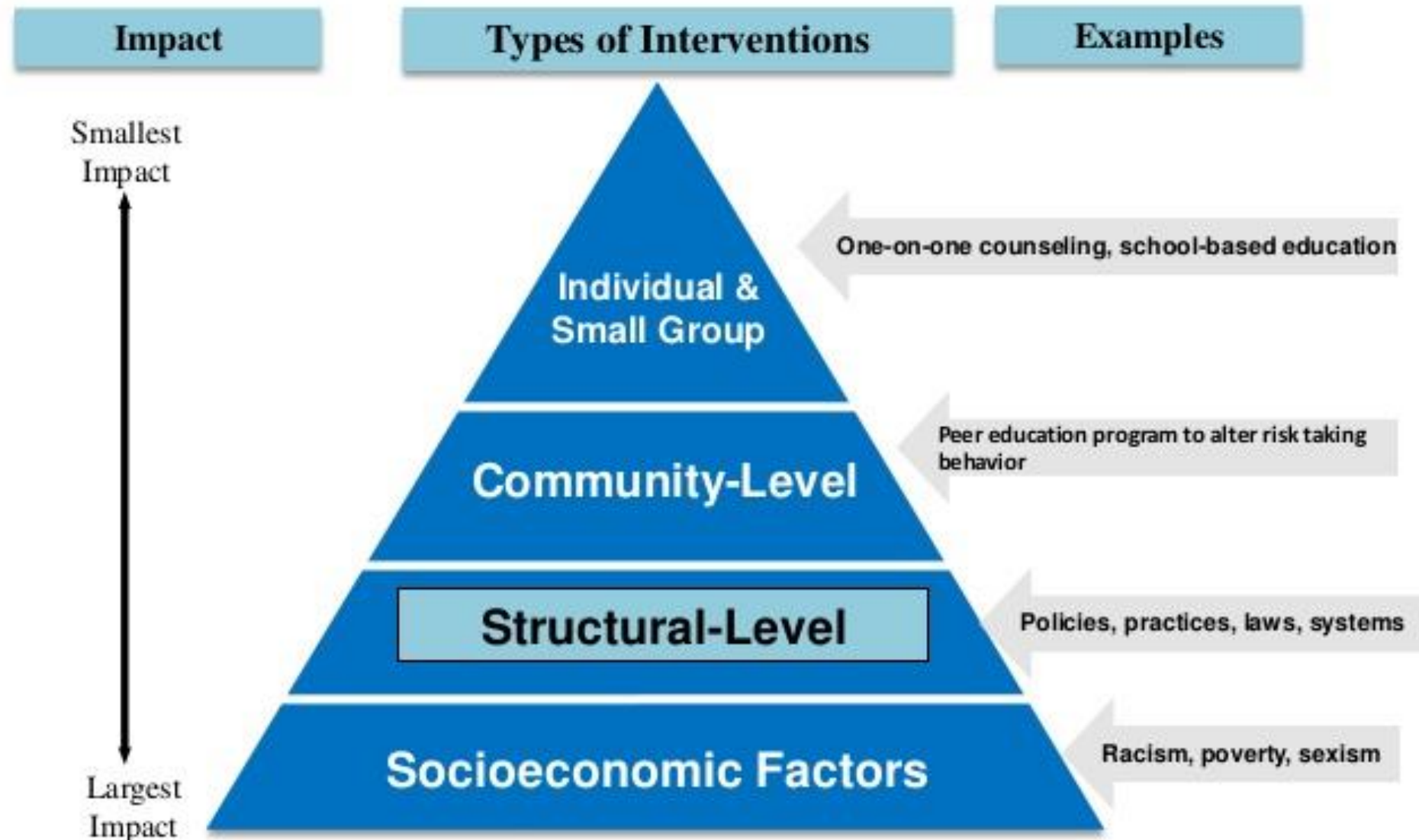
- ❑ **Community nutrition efforts involve a wide range of programs that provide:**
  - ✓ **increased access to food resources**
  - ✓ **nutrition information and education**
  - ✓ **health-related care**
  - ✓ **efforts to change behavior and environments**
  - ✓ **initiate policy**

# Public Health Practice Compared to Clinical Nutrition Practice

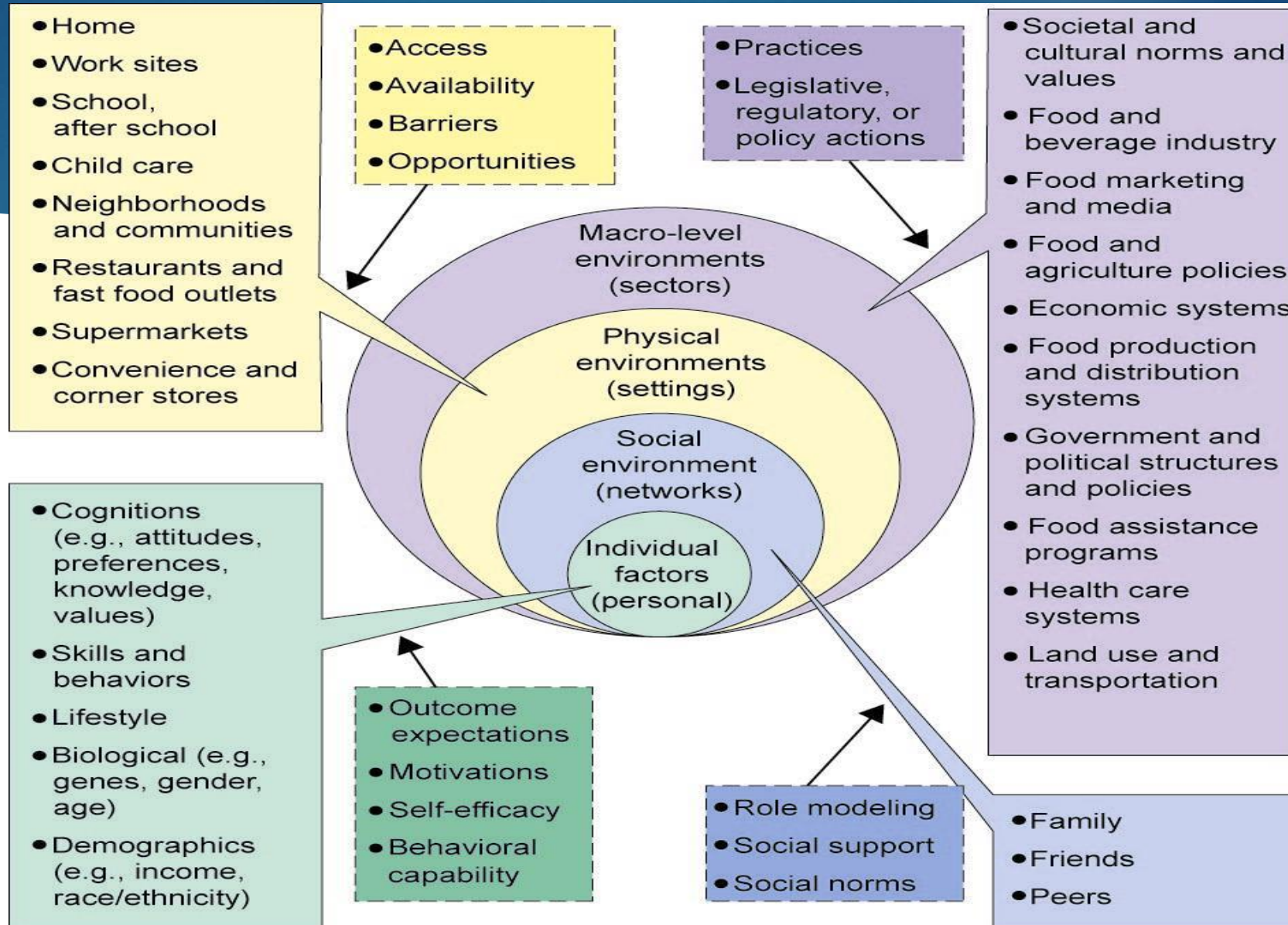


	<u>Public Health Practice</u>	<u>Clinical Nutrition Practice</u>
Focus	Prevention	Disease treatment
Target	Populations	Individuals
Setting	Country, district & Communities	Clinics & Hospitals
Strategies	Multiple, Reinforcing	Counseling and education

# Types of Interventions



# Ecological Framework for Influences on What People Eat



# Basic issues related to health and nutrition

**These issues include:**

- ▶ **Iodine and vitamin A deficiencies.**
- ▶ **Starvation and widespread chronic hunger.**
- ▶ **Under-nutrition, especially among children, women and the elderly.**
- ▶ **Other important micronutrient deficiencies including iron.**
- ▶ **Diet-related communicable and non-communicable diseases.**
- ▶ **Impediments to optimal breastfeeding.**
- ▶ **Inadequate sanitation and poor hygiene, including unsafe drinking water.**

# Food and Nutrition Policy

- ▶ A food and nutrition policy is a policy with a preventative and clinical health perspectives based on human rights.
- ▶ **The basic idea is that all members of the society should be granted enough food to grow and develop without disorders due to malnutrition (under or over nutrition).**
- ▶ The food and nutrition policy should adopt an integrated approach with collaboration among all relevant government ministries, non-governmental organizations (NGOs) and UN agencies.

**Reference: Nutrition in Jordan, Updates and plan of Action. Health Promotion Program, WHO.**



# Improving nutritional status is a global health challenge

- ▶ It is a challenge that requires effective action across a number of areas (food, health, social welfare, education, water, sanitation, and gender equity)
- ▶ and across a number of actors (government, civil society, private sector, research, and international development partners).

# Improving nutritional status is a global health challenge

- ▶ Poor nutrition is a challenge that casts a long-term shadow: its consequences flow throughout the life cycle and cascade down the generations affecting everyone— especially children, adolescent girls, and women—and include mortality, infection, cognitive impairment, lower work productivity, early onset and higher risk of noncommunicable diseases (NCDs), stigma, and depression.

# Dietary factors are associated with five of the ten leading causes of death

- ▶ **Coronary heart disease, some types of cancer, stroke, non-insulin dependent diabetes (type 2 diabetes), and atherosclerosis are associated with dietary factors.** Dietary excesses and imbalances contribute to the development of these diseases.
- ▶ Overweight and obesity which are estimated to affect nearly one third of the world population and it is an important contributing factor for disease and disability.

# Nutritional assessment

It defines nutritional problems that need attention, it is the first step in the nutrition program planning and management cycle. It provides baseline data for planning and evaluation of programs. It helps in identifying priorities in of the public health system.

## Methods of nutritional assessment:

- ▶ **Historical data: Medical history and diet history (24 hour recall, Food Frequency Questionnaire).**
- ▶ **Anthropometric measurements [height, weight, body mass index (BMI), waist circumference, hip circumference, etc..].**
- ▶ **Clinical assessment (physical examinations).**
- ▶ **Biochemical analyses (laboratory).**

# Nutritional Surveillance

- ▶ **Continuous monitoring of the nutritional status of selected population groups.**
- ▶ **Data is collected, analyzed, and utilized in an extended period of time.**
- ▶ **Useful in identifying causes of malnutrition, hence can be used in formulating and initiating intervention measures.**

# Major Nutritional Problems in Childhood

- ▶ **Overweight and obesity**
- ▶ **Iron deficiency**
- ▶ **Dental caries**
- ▶ **Allergies**
- ▶ **Lactose intolerance**

# Overweight/Obesity

- ▶ **Increasing prevalence**
- ▶ **Influence of access to food, eating tied to leisure activities, children making food decisions, portion sizes, and inactivity.**
- ▶ **Consequences: discrimination, negative self-image, depression, decreased socialization.**
- ▶ **Increases cardiovascular risk factors (hyperlipidemia, hypertension, and hyperinsulinemia) and type 2 diabetes.**

# Interventions for Childhood Obesity

- ▶ **Family involvement**
- ▶ **Dietary modifications**
- ▶ **Nutrition information**
- ▶ **Physical activity**
- ▶ **Behavioral strategies**
- ▶ **Prevention**



# Nutrition and Nutritional Problems in Adolescence

- ▶ Adolescence is a period of tremendous physical and cognitive changes.
- ▶ Teens are nutritionally vulnerable because of increased need for all nutrients at a time when changes in lifestyle and food habits greatly affect nutrient intake.
- ▶ Educating adolescents about the optimal energy and fat intake and level of physical activity helps them to develop a healthy body and lifestyle and avoid overweight, obesity and its co-morbidities of hypertension and hyperlipidemia.

# Nutrition and Nutritional Problems in Adolescence

## **Growth and Development:**

- ▶ **Physiologic changes**
- ▶ **Puberty, sexual maturity**
- ▶ **Growth velocity**
- ▶ **Independence and autonomy**
- ▶ **Body image**

# Cognitive and Emotional Development

- ▶ **Early adolescence (ages 13 to 15)**
- ▶ **Middle adolescence (ages 15 to 17)**
- ▶ **Late adolescence (ages 18 to 21)**

# Food Habits

- ▶ **Irregular meals**
- ▶ **Excessive snacking**
- ▶ **Eating away from home (especially fast foods)**
- ▶ **Dieting and meal skipping**

# Factors Influencing Food Habits

- ▶ **Decreasing influence of family**
- ▶ **Increasing influence of peers**
- ▶ **Increasing media exposure**
- ▶ **Increasing prevalence of employment outside home**
- ▶ **Increasing responsibilities (less time to eat with families)**

# Vegetarian Dietary Patterns

- ▶ Well-planned vegetarians diets can provide adequate nutrients
- ▶ Very restrictive diets may signal disordered eating
- ▶ Vegan diets do not provide vitamin B<sub>12</sub> and may be low in calcium, vitamin D, zinc, and iron
- ▶ Inappropriately selected vegetarian diets can result in malnutrition

# Obesity

- ▶ **Increasing prevalence of overweight and obese teenagers**
- ▶ **Multifactorial health issues**
- ▶ **Short-term and long-term health outcomes**
- ▶ **Importance of early identification and intervention**

# Hyperlipidemia and Hypertension

- ▶ **Onset of CVDs during youth**
- ▶ **Many risk factors are comorbid conditions**
- ▶ **Diagnosis and treatment**