PART I
Overview of the Public Health Nutrition Landscape
Community Nutrition and Public Health

CHAPTER OUTLINE
- Introduction
- The Concept of Community
- Public Health and Nutrition
- The Relationship Between Eating Behaviors and Chronic Diseases
- Reducing Risk Through Prevention
- Health Promotion
- Knowledge and Skills of Public Health and Community Nutritionists
- Places of Employment for Public Health and Community Nutritionists
- Preventive Nutrition

LEARNING OBJECTIVES
- Define public health and community nutrition.
- Discuss the relationship between diet and diseases.
- List current nutrition- and diet-related public health problems.
- Explain primary, secondary, and tertiary prevention.
- Outline the educational requirements, practice settings, roles, and responsibilities of community and public health nutritionists.
- Define the terms Registered Dietitian (RD) and public health nutrition.

Introduction
Community nutrition is a modern and comprehensive profession that includes, but is not limited to, public health nutrition, dietetics/nutrition education, and medical nutrition therapy. Community nutrition deals with a variety of food and nutrition issues related to individuals, families, and special groups that have a common link such as place of residence, language, culture, or health issues. There is an increasing need to focus on community in health promotion and disease prevention because behavior is highly influenced by the environment in which people live. Local values, norms, and behavior patterns have a significant effect on shaping an individual’s attitudes and behaviors. The increasing movement toward using a community approach requires community nutritionists to become more visible and vocal leaders of community health. However, before community nutritionists can participate in nutrition and healthcare planning, they must be knowledgeable about the concept of community as client.

The Concept of Community
The concept of community varies widely. The World Health Organization (WHO) defines community as “a social group determined by geographic boundaries and/or common values and interests.” Community members know and interact with one another; function within a particular social structure; and show and create norms, values, and social institutions. Suburbs and other areas surrounding the legal limits of a city are also an integral part of that city’s total community.

A second definition of community is demographic and involves viewing the community as a subgroup of the population, such as people of a particular age, gender, social class, or race. A community can
also be defined on the basis of a common interest or goal. A collection of people, even if they are scattered geographically, can have a common interest that binds its members. This is called a common-interest community. Many successful prevention and health promotion efforts, including improved services and increased community awareness of specific problems, have resulted from the work of common-interest communities. The following are some examples of common-interest communities:

- Members of a national professional organization (e.g., American Dietetic Association, American Medical Association, Federation of American Societies for Experimental Biology, African American Career Women, National Association of Asian American Professionals, American Public Health Association)
- Members of churches
- Disabled individuals scattered throughout a large city
- Individuals with specific health condition (e.g., diabetes, hypertension, breast cancer, mental illness)
- Teenage mothers
- Homebound elderly persons

Community nutrition and dietetics professionals are also members of a community and are public health agency professionals who provide nutrition services that emphasize community health promotion and disease prevention. They deal with the needs of individuals through primary, secondary, and tertiary preventions (which will be discussed in more detail later in this chapter).

- **Primary prevention** involves designing activities to prevent a problem or disease before it occurs.
- **Secondary prevention** involves planning activities related to early diagnosis and treatment, including screening for diseases.
- **Tertiary prevention** consists of designing activities to treat a disease state or injury and to prevent it from progressing further.

These professionals establish links with other professionals involved in a wide range of education and human services, such as childcare agencies; social work agencies; services to older persons; high schools; colleges and universities; and community-based epidemiological research.

### Public Health and Nutrition

**Public health** is defined as “the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort.”

The WHO estimated that prevention of the major nutrition-related risk factors (cigarette smoking, inactivity, poor dietary habits, and alcohol abuse) could translate into a gain of 5 years of disability-free life expectancy.

A community and public health nutrition approach will make it possible to reverse the course of major nutrition problems. Dietary professionals can take the lead in prevention programming because their training as counselors and educators provides skills that make them important members of a public health profession.

**Public health nutrition** was developed in the United States in response to societal events and changes to the following situations:

- Infant mortality
- Access to healthcare
- Epidemics of communicable disease
- Poor hygiene and sanitation
- Malnutrition
- Agriculture and food production (in response to changes in food production)
- Economic depression, wars, and civil rights
- Aging of the population
- Behavior-related problems/lifestyle (poor dietary practices, alcohol abuse, inactivity, and cigarette smoking)
- Chronic diseases (obesity, heart disease, diabetes mellitus, mental health, cancer, osteoporosis, and hypertension)
- Poverty and immigration
- Preschool/after-school child care and school-based meals

### The Relationship Between Eating Behaviors and Chronic Diseases

As evidenced by an introductory review of literature and research in the area of eating behavior and chronic disease, the relationship between...
eating behaviors and chronic diseases is significant and impacts individuals and communities greatly. Table 1-1 shows dietary factors that are linked to some of the most common chronic diseases. It is important to note that dietary factors overlap with other problems and are applicable to many of the health conditions listed.

The Surgeon General’s Report on Nutrition and Health, government agencies, and nonprofit health and scientific organizations have provided comprehensive analyses of the relationship among diet, lifestyle, and major chronic diseases. Health conditions such as coronary heart disease, stroke, cancer, and diabetes are still the leading causes of death and disability in the United States, and changes in Americans’ current dietary practices could produce substantial health gains.

There have been concerns about the eating patterns of the U.S. population since the 1980s. Health policy makers have linked several dietary-related factors to chronic diseases, such as heart disease, cancer, birth defects, and osteoporosis, among the U.S. population and that of other industrialized countries. Health conditions such as coronary heart disease, stroke, cancer, and diabetes are still the leading causes of death and disability in the United States, and changes in Americans’ current dietary practices could produce substantial health gains.

There have been concerns about the eating patterns of the U.S. population since the 1980s. Health policy makers have linked several dietary-related factors to chronic diseases, such as heart disease, cancer, birth defects, and osteoporosis, among the U.S. population and that of other industrialized countries. This link between diet and disease has led to the publication of guidelines to promote healthier eating habits. The National Academy of Sciences, the U.S. Department of Health and Human Services, and the U.S. Surgeon General have published the majority of these guidelines.

In addition to dietary intake, many other factors contribute to chronic diseases, such as genetic factors and lifestyle factors (e.g., cigarette smoking). Medical geneticists working on the Human Genome Project, a major international initiative to decipher the 3-billion-unit code of DNA in the 80,000 to 100,000 genes found in humans, have already identified genes associated with many chronic diseases, such as breast, colon, and prostate cancers; severe obesity; and diabetes.

Programs to promote health and longevity start with examining the major causes of death and disability. The top causes of death from Public speaking is a great way to pass along nutrition information.

**TABLE 1.1** Some Possible Health Problems Linked with Poor Dietary Habits

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Eat foods lower in total fat, saturated fat, and cholesterol</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Eat foods lower in calories; balance caloric intake with physical activity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Drink alcohol in moderation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat less cured and smoked foods</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare foods with less salt</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in calcium and vitamin D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in iron</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in folic acid</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in antioxidants</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in soluble and insoluble fiber</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat foods high in omega-3 fatty acids</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeed infants</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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The 10 Leading Causes of Death in the United States

<table>
<thead>
<tr>
<th>#</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart disease</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
</tr>
<tr>
<td>3</td>
<td>Stroke</td>
</tr>
<tr>
<td>4</td>
<td>Chronic lower respiratory disease</td>
</tr>
<tr>
<td>5</td>
<td>Accidents</td>
</tr>
<tr>
<td>6</td>
<td>Diabetes</td>
</tr>
<tr>
<td>7</td>
<td>Pneumonia/influenza</td>
</tr>
<tr>
<td>8</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>9</td>
<td>Nephritis, nephritic syndrome, and nephrosis</td>
</tr>
<tr>
<td>10</td>
<td>Septicemia</td>
</tr>
</tbody>
</table>


The 10 Leading Causes of Death Worldwide

<table>
<thead>
<tr>
<th>#</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischemic heart disease</td>
</tr>
<tr>
<td>2</td>
<td>Stroke</td>
</tr>
<tr>
<td>3</td>
<td>Acute lower respiratory infections</td>
</tr>
<tr>
<td>4</td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>5</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>6</td>
<td>Perinatal conditions</td>
</tr>
<tr>
<td>7</td>
<td>Diarrheal diseases</td>
</tr>
<tr>
<td>8</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>9</td>
<td>Malaria</td>
</tr>
<tr>
<td>10</td>
<td>Cancer of the lung/bronchus/trachea</td>
</tr>
</tbody>
</table>


Reducing Risk Through Prevention

Prevention is important in public health as well as community nutrition practice. The three important parts of prevention are personal, community-based, and systems-based. Each part has a different role and focus. Establishing an overall effective community nutrition practice involves correctly using and combining each part.

- **Personal prevention** involves people at the individual level; for instance, educating and supporting a breastfeeding mother to promote the health of her infant.
- **Community-based prevention** targets groups; for example, public campaigns for low-fat diets to decrease the incidences of obesity and/or heart disease.
- **Systems-based prevention** deals with changing policies and laws in order to achieve the objectives of prevention practice; for example, laws regarding childhood immunization, food labels, food safety, and sanitation.

One part of systems-based prevention deals with socioeconomic status, which affects health through environmental or behavioral factors. The socioeconomic model hypothesizes that poor families do not have the economic, social, or community resources needed to be in good health. For instance, poverty affects children’s well-being by influencing health and nutrition, the home environment, and neighborhood conditions. The combined effects of poverty provide the foundation for a cycle of poverty and hopelessness among family members, who in turn engage in risky health behaviors, such as substance abuse, smoking, and poor dietary habits, that can result in obesity and nutrition-related chronic diseases.

Socioeconomic models have been used to develop policies and disease prevention strategies, such as the Mackenbach model, which can be used as a basis for developing policies and intervention strategies. The Mackenbach model is presented in **Figure 1-1**. Mackenbach proposed that the link between socioeconomic status and health-related problems is triggered and maintained by two processes (selective and causative) that are active during different periods of life. The selective and causative processes are represented in the figure by the arrows labeled 1 and 2, respectively. The different arrows between socioeconomic factors represent potential entry points for policies and interventions to reduce health inequalities.

**Figure 1-1** Selective and Causative Factors Involved in the Development of Health Inequalities in Society

# Chapter 1 Community Nutrition and Public Health

<table>
<thead>
<tr>
<th>Primary Prevention</th>
<th>Personal Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health Promotion</strong></td>
<td><strong>Community Approach</strong></td>
</tr>
<tr>
<td>• Nutrition education</td>
<td>• Breastfeeding support</td>
</tr>
<tr>
<td>• Water fluoridation to prevent dental decay</td>
<td>• Wellness education for an individual/physical activity</td>
</tr>
<tr>
<td>• Provision of nutritious foods</td>
<td>• Stress management education for an individual to reduce blood pressure</td>
</tr>
<tr>
<td>• Physical activity education</td>
<td></td>
</tr>
<tr>
<td>• Genetic screening</td>
<td></td>
</tr>
<tr>
<td>• Food intake analysis</td>
<td></td>
</tr>
<tr>
<td>• Food safety education</td>
<td></td>
</tr>
<tr>
<td>• Prenatal care</td>
<td></td>
</tr>
<tr>
<td><strong>Specific Protection</strong></td>
<td><strong>System Approach</strong></td>
</tr>
<tr>
<td>• Use of specific immunizations</td>
<td>• &quot;Fruits &amp; Vegetables—More Matters&quot; campaign</td>
</tr>
<tr>
<td>• Attention to personal hygiene</td>
<td>• School health education</td>
</tr>
<tr>
<td>• Use of 24-hour recall and food frequency list</td>
<td>• Community campaign for wellness (Heart Healthy for women)</td>
</tr>
<tr>
<td>• Use of environmental sanitation</td>
<td></td>
</tr>
<tr>
<td>• Protection against obesity</td>
<td></td>
</tr>
<tr>
<td>• Protection from foodborne illness</td>
<td></td>
</tr>
<tr>
<td>• Use of specific nutrients</td>
<td></td>
</tr>
<tr>
<td>• Protection from carcinogens</td>
<td></td>
</tr>
<tr>
<td>• Avoidance of food allergens</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Prevention</th>
<th>Personal Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early diagnosis and Prompt Treatment</strong></td>
<td><strong>Community Approach</strong></td>
</tr>
<tr>
<td>• Screening surveys</td>
<td>• Cholesterol screenings</td>
</tr>
<tr>
<td>• Selective examinations to:</td>
<td>• Blood pressure screening at the community center</td>
</tr>
<tr>
<td>• Prevent disease process</td>
<td></td>
</tr>
<tr>
<td>• Prevent the spread of communicable disease</td>
<td></td>
</tr>
<tr>
<td>• Identify and intervene for individuals at risk of obesity, diabetes, and iron deficiency anemia</td>
<td></td>
</tr>
<tr>
<td><strong>Disability Limitations</strong></td>
<td><strong>System Approach</strong></td>
</tr>
<tr>
<td>• Adequate food intake to arrest disease process and prevent further complications</td>
<td>• &quot;Shape up America&quot;</td>
</tr>
<tr>
<td>• Provision of exercise facilities to limit disability and prevent death from obesity, heart disease, and cancer</td>
<td>• Fat and calorie labels</td>
</tr>
<tr>
<td></td>
<td>• Pasteurization of dairy products</td>
</tr>
<tr>
<td></td>
<td>• Fortification of milk with vitamin D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tertiary Prevention</th>
<th>Personal Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Restoration and Rehabilitation</strong></td>
<td><strong>Community Approach</strong></td>
</tr>
<tr>
<td>• Provision of medical nutrition therapy for individuals with nutrition-related problems</td>
<td>• Advocating for special diets to be provided with diabetic nutrition education in the community</td>
</tr>
<tr>
<td>• Education for the public and industry to produce low-fat foods</td>
<td></td>
</tr>
<tr>
<td><strong>System Approach</strong></td>
<td><strong>System Approach</strong></td>
</tr>
<tr>
<td></td>
<td>• Passing legislation mandating that low-fat diets be provided in schools</td>
</tr>
<tr>
<td></td>
<td>• New regulations for folate fortification of certain foods</td>
</tr>
<tr>
<td></td>
<td>• Legislation to mandate payment of nutrition services for diabetes and obesity services</td>
</tr>
<tr>
<td></td>
<td>• Advocating for fast-food restaurants to provide information on the fat content of meals</td>
</tr>
</tbody>
</table>

**Figure 1-2** The Three Levels of Prevention and Intervention Approaches

process is represented by childhood health, which determines adult health as well as socioeconomic position. The causative process represents three groups of risk factors (lifestyle, structural/environmental, and psychosocial stress-related factors), which are intermediaries between socioeconomic position and health problems. The model also acknowledges that childhood environment and cultural and psychological factors contribute to inequalities in health through both selection and causation. Health inequalities become self-perpetuating through a cycle of inadequate childhood health, adult socioeconomic position, and incidence of health problems at adult ages.41

Levels of Prevention
Each part of prevention itself has three levels. Primary prevention is an early intervention focused on controlling risk factors or preventing diseases before they happen, thus reducing their incidence. Examples of primary prevention include fortifying milk with vitamin D to prevent rickets in children, fortifying infant formula with iron to prevent anemia, and fluoridating public water supplies to prevent dental decay. Secondary prevention includes identifying disease early (before clinical signs and symptoms manifest) through screening. Timely intervention is provided to deter the disease process and prevent disability that may be caused by the disease. For instance, providing nutrition education on the importance of reducing dietary cholesterol, saturated fat, and caloric intake and increasing dietary fiber to individuals with high blood cholesterol is a secondary intervention to prevent complications of heart disease.42–45 Tertiary prevention is intervention to reduce the severity of diagnosed health conditions in order to prevent or delay disability and death. For example, providing education programs for persons recently diagnosed with hypertension is an intervention to prevent disability and additional health problems.46 Figure 1-2 presents the three levels of prevention and intervention approaches.

Health Promotion
Health promotion is another major concept that is important to community and public health nutrition. Health promotion can be defined as the process of enabling people to increase control over the determinants of good health and subsequently improve their health. Two strategies that can be used to design a health promotion campaign in order to reduce risk are presented in Table 1.2, and the advantages and disadvantages of these strategies are presented in Box 1-3.

Knowledge and Skills of Public Health and Community Nutritionists
In most instances a community or public health nutritionist must be a member of an interdisciplinary team in order to provide an effective nutrition program. An interdisciplinary team is a collaboration among personnel representing different disciplines of public health workers (nurses, social workers, physicians, daycare workers, dietitians, and dietetic technicians). They use various approaches to diagnose and address public or community issues, including:47

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### Table 1.2 Strategies for Designing a Health Promotion Campaign

<table>
<thead>
<tr>
<th>Concept</th>
<th>Benefit</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Members of the community may lower their risk by a small percentage, thereby reducing new cases of chronic health conditions and mortality.</td>
<td>A nutritionist changing the eating patterns of families and advocating for fluoridation of the water supply—rather than screening all postmenopausal women for bone loss or hiring dentists to treat every child and adolescent—may reduce the risk of osteoporosis and dental decay. Instruction about reducing sodium intake may reduce a population’s mean systolic blood pressure by 3 percent, which will decrease the number of people in the high-risk group by 25 percent if high risk for systolic blood pressure is considered to begin at 140 mmHg. If excess body weight is 92 kg/202 pounds, reducing the population’s mean weight by 1 kg/2.2 pounds (about 1 percent) will cut the number of overweight people by 25 percent. Instruction could be provided to engage in regular physical activity and reduce excess calorie consumption. If everyone is encouraged to consume high calcium and/or low-fat food products and then food industries develop and market these food products, this will subsequently prevent osteoporosis and obesity. The Fruits &amp; Veggies—More Matters campaign is an example of a population approach to health promotion.</td>
</tr>
<tr>
<td>Individual</td>
<td>The nutritionist focuses on identifying individuals at risk, and the intervention is directed specifically at these “high-risk” individuals.</td>
<td>This method may be more beneficial when the risk conditions are highly restricted, such as with preschool children who were exposed to foods containing lead. Intervention could be limited to persons with family histories of heart disease, and these people could be taught about reducing fat intake and increasing physical activities to reduce the potential of experiencing heart disease. Nutrition intervention could be limited to the children of adult alcoholics, individuals with a family history of diabetes, and low-income pregnant women participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which may translate to risk reduction.</td>
</tr>
</tbody>
</table>


### Box 1.3 Advantages and Disadvantages of Population and Individual Health Promotion Strategies

**Advantages**

**Population Approach**
- The population approach may instigate a behavior change that may become the norm and create conditions that makes it easier for any individual to change. For example, if everyone is urged to reduce their fat and saturated fat intake, this increases the incentive for the food industry to develop and market products that are low in fat and/or saturated fat, such as low-fat milk, which makes it easier to adopt a low-fat diet.
- The population approach is likely to save more lives and prevent more illness than the individual approach when the risk factors are widely diffused throughout the community.

**Individual Approach**
- Using the individual approach, people at high risk are specifically targeted, and the intervention is provided on time. More attention is given to ensuring that individuals with chronic disease are following necessary, strict dietary programs.
- Using the individual approach reduces the costs associated with screening an entire population and releases health professionals to attend to the community’s other healthcare needs.

**Disadvantages**

**Population Approach**
- This approach requires mass change and may not be needed by the entire population.
- It may not be cost effective and may inconvenience people.

**Individual Approach**
- With the individual approach, screening may not be universal and thus some high-risk individuals may not be identified.

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PART I Overview of the Public Health Nutrition Landscape

- Utilizing interventions that promote health and prevent communicable or chronic diseases by managing or controlling the community’s environment.
- Channeling funds and energy to programs that affect the lives of the largest numbers of people in a community.
- Seeking out unserved or underserved populations (due to income, age, ethnicity, heredity, or lifestyle) and those who are vulnerable to disease, hunger, or malnutrition.
- Collaborating with the public, community leaders, legislators, policy makers, administrators, and health and human service professionals to assess and respond to community needs and consumer demands.
- Monitoring the public or community’s health in relation to public health objectives, and continuously addressing current and future needs.
- Planning, organizing, managing, directing, coordinating, and evaluating the nutrition component of health agency services.

For community nutritionists to accomplish these actions, they need to acquire normal and clinical nutrition knowledge and be skilled in educating the public regarding changes in eating behavior. The minimum education requirements for a community nutritionist include a bachelor’s degree in foods and nutrition or dietetics from an accredited college or university and a Master of Public Health degree with a major in nutrition or a Master of Science degree in applied human nutrition with a minor in public health or community health. Some community nutrition positions require certification as a Registered Dietitian (RD) and/or an advanced degree in nutrition. Academic training includes knowledge of biostatistics and skill in collecting, analyzing, and reporting demographic, health, and food nutrition data.

The community nutritionist must understand the epidemiology of health and disease patterns in the population as well as trends of diseases over a long period of time. She or he must be knowledgeable about the principles of health education, program planning, program evaluation, community organization, management, and marketing and policy formation. Marketing skills are very important because they help nutritionists know how to convey effective nutrition messages using a variety of media formats for their audiences. Community nutritionists must keep current with advances in research and food and nutrition sciences, and changing practices in public health service.

In some situations, Dietetic Technicians, Registered (DTRs) are employed in the food service area, clinical settings, and community settings. They may assist the community nutritionist/Registered Dietitian in determining the community’s nutritional needs and in providing community nutrition programs and services. At a minimum, DTRs must have an associate’s degree from an approved educational program. After that, they must successfully complete a national examination administered by the Commission on Dietetic Registration (CDR).

Both community and public health nutritionists provide a wide variety of nutrition services through government and non-government agencies at the local, state, national, and international levels. In most cases, the activities require multitasking roles such as blood pressure screening, diet counseling, and medical nutrition therapy. At the international level, duties may include education on sanitation, water purification, and gardening.

Places of Employment for Public Health and Community Nutritionists

Community and public health nutritionists’ work in official community settings or voluntary agencies to promote health, prevent disease, conduct epidemiologic research, and provide both primary and secondary preventive care. The agencies include city, county, state,

Successful Community Strategies

The National Cancer Institute’s Health Promotion Intervention

Community and public health nutritionists can also target worksites as a priority location for intervention efforts. An effective worksite nutrition program must include how to effectively communicate to clients how to choose and prepare foods that follow established dietary guidelines. One example of an effective worksite program is Working Well, which was a randomized worksite intervention trial. This 5-year study funded by the National Cancer Institute (NCI) tested the effectiveness of health promotion interventions directed at individual and organizational changes to reduce employee cancer risk in 57 matched pairs of worksites. Workers and worksites from a variety of geographic and industrial settings were utilized. Four project study centers, a coordinating center, and the NCI collaborated on common elements of design, data collection and analysis, and intervention standards for the common risk factor areas. All Working Well study centers targeted nutrition and at least one other prevention component (e.g., smoking, cancer screening, occupational health, or physical activity). The study centers were Brown University School of Medicine and The Miriam Hospital (Rhode Island); the University of Florida; the University of Massachusetts Medical School and Dana-Farber Cancer Institute; and the University of Texas M.D. Anderson Cancer Center.

The Working Well intervention was based on a conceptual model that incorporated three important elements:

- The use of participatory strategies operated through a primary worksite contact and an employee advisory board
- An ecological approach targeting both individual behavior change and change in environmental and organizational structures
- The use of adult education and behavior change strategies in all aspects of intervention planning and delivery

The nutrition intervention messages are available in a summarized format at http://nutrition.jbpub.com/communitynutrition. The messages were translated from nutrient terms into food terminology. They addressed groups of foods that contribute the highest amount of fat and fiber to the U.S. diet. All groups of foods were stated in positive terms.
Preventive Nutrition

Preventive nutrition can be defined as dietary practices and interventions directed toward a reduction in disease risk and/or improvement in health outcomes. Preventive nutrition is an important strategy that works to prevent disease instead of treating the condition after it materializes.

The U.S. government and other health agencies have taken actions to reduce the incidences of chronic diseases, such as recommending a reduction in saturated fat intake for cardiovascular disease prevention and inclusion of B vitamins, vitamins A and D, iron, and calcium in staple foods such as grain products, milk, and cereals to prevent nutrient-related health conditions. These preventive nutrition strategies have been part of public health policy for many years and have been effective in preventing nutrition-related health conditions.

For example, there has been a decrease in cardiovascular disease mortality in the past 25 years due to the massive campaign to reduce fat intake and increase physical activity in the United States and most industrialized countries. Other concerns have prompted policy change regarding prevention of chronic diseases. The high costs of medical care put economic pressure on both individuals and nations to prevent chronic diseases.

The intervention was implemented in 114 worksites employing 37,291 workers who were engaged in a variety of businesses. In the fall of 1990, 20,801 respondents completed and returned a self-administered baseline survey. The worksite mean response rate was 71.6 percent. Responses to behavioral items regarding meat were used to measure meat preparation behaviors that could not be obtained from the food frequency questionnaire (FFQ).

The intervention outcome showed that the average servings of fruits and vegetables per day were less than three in all study centers—2.7 in Florida, Massachusetts, and Rhode Island and 2.4 in Texas. Less than 30 percent of workers in Rhode Island and Massachusetts reported eating beans and lentils at least once a week while 42 percent in Florida and 56 percent in Texas reported frequent bean and lentil consumption. Fifty-six to 64 percent of workers reported eating high-fiber cereal at least half of the time that they ate cereal, and 34 to 46 percent reported eating dark bread at least half of the time that they ate bread.

The majority of workers reported eating chicken and fish that were not fried (55 to 84 percent), rarely eating visible meat fat (57 to 69 percent), and choosing lean meat (68 to 81 percent). On the other hand, avoiding the skin on chicken was reported less frequently (33 to 47 percent). Avoidance of meat fat was lower in Texas than in the other study sites for all four measures.

With regard to fat in dairy products, 65 to 71 percent drank low-fat or skim milk more than half of the time that they drank milk. Also, a smaller percentage, 42 to 64 percent, used low-fat cheese or low-fat frozen dairy products. The percentage that used low-fat dairy products other than milk was much higher in the Florida worksite than in worksites at the other study centers. Finally, 46 to 53 percent of subjects used low-fat salad dressing.

The cost of cardiovascular diseases and stroke in the United States for 2006 was estimated at $403.1 billion. Estimates show that $22 billion per year could be saved in this disease category if preventive nutrition measures were fully implemented.57

Another disease category that could be significantly impacted if prevention were emphasized more strongly is that of birth defects. Birth defects are the number one cause of hospitalizations.58 The possibility of reducing infant morbidity and mortality by nutritional interventions becomes a tangible outcome when research shows that women who take a folic acid–containing multivitamin daily for at least 1 month before conception and during their pregnancies have about a 50 percent decrease in neural tube defects.57,58 This outcome alone is expected to save about $70 million annually.59

In addition, a decrease in medical care for breastfeeding infants is the primary socioeconomic benefit of breastfeeding. Medicaid costs for infants breastfed by low-income mothers in Colorado were $175 lower than for infants who were fed formula.60 However, breastfed infants are less likely to have any illness during the first year of life. It is reported that infants who were never breastfed required more care for lower respiratory tract illness, otitis media (ear infection), and gastrointestinal disease than infants breastfed for at least 3 months.61

The Cooperative Extension System
The Cooperative Extension System (CES) is an agency under the U.S. Department of Agriculture. It provides educational programs that help individuals and families acquire life skills. The CES’s mission is to empower people through education using scientific, research-based information.1 Typically, land grant universities or colleges help carry out the CES’s mission by providing their expertise to county and regional extension offices, which administer these programs. The colleges and universities help the public through nonformal, noncredit programs. The federal government provides support for the programs through the Cooperative State Research, Education, and Extension Service (CSREES). CSREES supports both the universities and their local offices by annually distributing federal funding to supplement state and county programs.52

The Morrill Act of 1862 established land-grant universities to educate citizens in agriculture, home economics, mechanical arts, and other practical professions. In 1914 the Smith-Lever Act established a partnership between the USDA and land-grant universities. Currently, CES works in six major areas.62

- 4-H youth development: Helps youth make life and career choices. At-risk youth participate in school retention and enrichment programs. They learn science, math, and social skills using hands-on projects and activities.
- Agriculture: Helps individuals learn new ways to improve their agricultural income through research-based management skills, resource management, controlling crop pests, soil testing, livestock production practices, and marketing.
- Leadership development: Trains extension professionals and volunteers to serve in leadership roles in the community and deliver programs.

Successful Community Strategies
The Clemson University Cooperative Extension Nutrition Program on Low-Fat Products and Fat Intake44-49

The percentage of calories from saturated and polyunsaturated fat and the amount of cholesterol in the diet are important determinants of the level of plasma cholesterol, a major contributor to heart disease risk. It is estimated on average that a 1 percent decrease in the intake of saturated fat results in a 2-mg/dl decrease in plasma cholesterol. This, in turn, can bring about a reduction in heart disease risk. High intake of dietary fat is also associated with an increased risk for developing cancer of the colon, prostate, and breast.

Programs that have demonstrated effective community interventions for a decrease in dietary fat include a program from Clemson University in South Carolina, which incorporated community nutrition classes, grocery store tours, speakers’ bureaus, professional education classes, home study courses, and worksite nutrition education programs. This program focused on the impact of low-fat diets on serum cholesterol. The intervention community, compared with a control community, had a significant decrease in the intake of dietary fat (9 percent vs. 4 percent) and an increase in awareness of restaurant information (33 percent vs. 19 percent).

In South Carolina, 61 percent of adults were overweight or obese. From 1990 to 2002, the obesity rate among adults in South Carolina increased by 90 percent. The African American, Hispanic, and Native American populations in South Carolina had significantly high prevalence rates of obesity. About 15 percent of South Carolina’s high school students were at risk of becoming overweight and approximately 11 percent were overweight. Data showed that less than 25 percent of all South Carolina’s adults and only 18 percent of South Carolina high school students ate the recommended five or more servings of fruits and vegetables each day. Obesity is associated with many health conditions, some of which include heart disease, stroke, and diabetes. These also make up the three major causes of death and disability in South Carolina. In South Carolina, medical expenditure due to obesity per year was $1.06 billion.

Clemson’s Extension agent provided low-fat programs at regional volunteer leader training, an assisted living facility, three community groups, and a summer youth camp. A low-fat nutrition education program was presented to 38 family and community project leaders at regional
programs in gardening, health and safety, and family and consumer issues.

- **Natural resources**: Provides educational programs in water quality, timber management, composting, lawn and waste management, and recycling to landowners and homeowners.
- **Family and consumer sciences**: Teaches families and individuals about nutrition, food preparation, positive child care, family communication, financial management, and healthcare strategies so they can become healthy.
- **Community and economic development**: Helps local governments improve job creation and retention, small and medium-sized business development, effective and coordinated emergency response, solid waste disposal, tourism development, workforce education, and land use planning.

In addition, the Expanded Food and Nutrition Education Program (EFNEP) is a federally funded program designed specifically for nutrition education. The county extension home economists provide on-the-job training and supervise paraprofessionals and volunteers who teach EFNEP to low-income families and individuals. The Successful Community Strategies features in this chapter discuss the successful Clemson University Cooperative Extension Nutrition Program on low-fat products and fat intake as well as a National Cancer Institute health promotion intervention program.

Children learn more about nutritious foods when they are involved in meal preparation.
Chapter Summary

- Community nutrition is a modern and comprehensive profession that includes, among other disciplines, public health, dietetics/nutrition education, and medical nutrition therapy.
- The World Health Organization (WHO) defines community as “a social group determined by geographic boundaries and/or common values and interests.” Community members know and interact with one another, function within a particular social structure, and create norms, values, and social institutions.
- A community can also be defined on the basis of a common interest or goal. A collection of people, even if they are scattered geographically, can have a common interest that bind the members together.
- Community strengths can be physiological, psychological, social, or spiritual.
- Community nutrition and dietetics professionals are members of community and public health agency professionals who provide nutrition services that emphasize community health promotion and disease prevention.
- Public health has been viewed as the scientific diagnosis and treatment of the community. In this vision, the community, instead of the individual, is seen as the patient.
- In addition to dietary factors, two primary determinants of health status are genetics and lifestyle.
- Prevention is important in public health as well as in community nutrition practice. The three aspects of prevention are personal, community-based, and systems-based health.
- The three levels of prevention are primary, secondary, and tertiary prevention.
- Population and individual approaches are the two important strategies to choose from when designing a health promotion campaign aimed at risk reduction. The population approach directs instruction at the whole population or large sections of it whereas the individual approach identifies those most at risk from the risk factor, and intervention is targeted specifically at these “high-risk” individuals.
- Health promotion can be defined as the process of enabling people to increase control over the determinants of good health and subsequently improve their health.
- The negative consequences of nutrition-related problems include malnutrition and chronic health conditions such as obesity, cardiovascular diseases, cancer, diabetes mellitus, and childhood deaths.
- Public health and community nutritionists carry out a wide variety of nutrition activities through various agencies at the local, state, national, and international levels. In most cases, the activities require multitasking roles such as blood pressure screening, diet counseling, and medical nutrition therapy.
- Preventive nutrition can be defined as dietary practices and interventions directed toward the reduction in disease risk and/or improvement in health outcomes.
- The Cooperative Extension (CE) System is an agency under the U.S. Department of Agriculture. It provides educational programs that help individuals and families acquire life skills.

Critical Thinking Activities

The working poor (defined as families whose earnings are less than twice the federal poverty level and in which the adults work an average of half time or more during the year) are increasing in the current economy. Many public health programs may be eliminated or minimized, such as immunizations for all children and flu shots on demand for all people. Additionally, eligibility criteria for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program may be altered.

- Divide into groups and provide each group a certain amount of money, for instance, $100,000. Then distribute the funds among the three levels of prevention (primary, secondary, and tertiary) and discuss the rationale behind the decisions. The table below presents examples of programs.
- Select four health issues from Table 1.1 and discuss the types of early intervention programs that can prevent the health conditions.

<table>
<thead>
<tr>
<th>Primary Prevention</th>
<th>Secondary Prevention</th>
<th>Tertiary Prevention</th>
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<tbody>
<tr>
<td>Local Fruits &amp; Veggies—More Matters campaign to schools</td>
<td>Worksite nutrition education for high-risk employees</td>
<td>Medical nutrition therapy for individuals with nutrition-related problems (e.g., heart disease)</td>
</tr>
<tr>
<td>School breakfast and lunch</td>
<td>Health fair screening and referrals to primary care providers</td>
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<tr>
<td>Breastfeeding support</td>
<td>Immunizations for all children</td>
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<tr>
<td>Prenatal care</td>
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Case Study 1-1

Beatrice is a community nutritionist (RD) who was employed to provide nutrition education programs to a group of pregnant teenagers attending high school in a Midwestern city of 200,000 people. The teenagers eat most of their meals on campus. Some participate in the school lunch program; others prefer purchasing foods from the vending machine located a few feet away from the cafeteria. Beatrice was asked to help improve the teenagers’ nutrition and fitness status. Meetings with the teenagers revealed their opinions about food and physical activity. A 3-day dietary record and food frequency questionnaire were administered to the teenagers, and body measurements, such as height and weight for determining body mass index (BMI), were collected. She uncovered the following information:

- Analysis of the teenagers’ food choices revealed a high fat intake of 39 percent of total calories.
- Thirty percent of the teen mothers surveyed were obese and anemic, 40 percent were overweight, and 30 percent were underweight and anemic.
- In the vending machines in and around the high school, 80 percent of snacks were sugary or high fat, such as chips, and the machines contained soft drinks or other items with empty calories.
CHAPTER 1 Community Nutrition and Public Health

Further analysis showed that the teen mothers’ physical activity levels were inadequate.

The following plans reflect the program Beatrice devised after several meetings with the pregnant teenagers:

- Included fresh fruits and vegetables on every cafeteria menu. (These foods can offer vitamins, minerals, and fiber as well as decrease the number of high fat items available.)
- Evaluated and found a place where they can perform physical activity and campaigned for needed changes.
- Established a place for physical activity around the teens’ homes. (Inactivity is a major contributor to obesity.)
- Collaborated with the school food service director and the vending machine vendors to stock the vending machines with snacks low in fat and sugar and replace sugary soft drinks with fruit juices.

Activities

- Divide into groups and determine the locations for the WIC and Food Stamp Programs in your community. Then, encourage the teen mothers to enroll in these programs to obtain adequate prenatal care and nutrition counseling by giving them the addresses of the Food Stamp and WIC Programs and the name of the WIC nutritionist.
- Collect and analyze a 3-day food record from a female high school student and compare the results with a female college student.
- Analyze a school lunch meal and determine the fat, protein, calcium, vitamin D, folic acid, iron, and fiber content.
- Provide a list of foods that are high in iron, calcium, and vitamin D.
- Provide a list of foods fortified with folic acid.
- Provide a list of foods low in saturated fat and cholesterol.

References

1. Frank-Spohrer G. Community Nutrition: Applying Epidemiology to Contemporary Practice. 2nd ed. Sudbury, MA: Jones and Bartlett; 2008.
PART I  Overview of the Public Health Nutrition Landscape


